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Quebec Bridge Steel

The Contract Taken by the Carnegie Steel Company

Proposed Consolidation of Virginia Furnaces—Structural Steel Prices Unstable

The pig iron market has grown quieter, while finished steel products are moving rather under the momentum of February than from any fresh impulse. The slackening of business in other industries is not promising, yet there is no definite note of complaint thus far in iron and steel.

While pig iron buyers are not actively in the market, some little business has been done quietly. A large sale of Southern pipe iron is reported somewhat below the $11, Birmingham, basis for No. 2, and some further sales of Southern foundry iron are reported at $11 for delivery through, and in a few cases beyond, the third quarter. In the Buffalo district the prices recently prevailing for early shipment have been shaded under new pressure to sell.

Eastern furnaces are interested in an inquiry for 6000 tons of basic iron for a Canadian steel plant. With water shipment, Southern furnaces have a fair chance for this order.

The Steel Corporation's pig iron operations are practically unchanged, 72 per cent. of its blast furnaces being active this week. Three furnaces of independent steel companies have gone in in March, and the merchant furnace output is increasing slightly.

The effort made a few years ago to consolidate the Virginia blast furnaces located on the Chesapeake & Ohio Railroad has been renewed lately. Only preliminaries have been considered, and the outcome is still uncertain.

Among late rail orders are 4000 tons for the Lehigh & New England and 6550 tons for the George's Creek & Cumberland, placed with the Bethlehem Steel Company, and 4000 tons for the Western Maryland, which went to the Maryland Steel Company.

The $20,000,000 bridge to connect the New Haven road with the Pennsylvania Railroad's Long Island lines, via Hell Gate and Randall's Island, has become a live project recently, and the steel requirements, which may exceed 60,000 tons, are under consideration. The Lehigh & New England bridge at Bethlehem, Pa., 1600 tons, has been let, and 4000 tons of railroad bridgework is pending, including 1700 tons for the Rock Island. The aggressiveness of some fabri-

cating companies has been so marked in recent competitions as to threaten the maintenance of the co-operative price of 1.40c. at Pittsburgh on structural shapes.

The newly organized St. Lawrence Bridge Company, in which Canadian bridge companies are interested, has been awarded the contract for the Quebec Bridge, and the 60,000 tons of steel will be furnished by the Carnegie Steel Company. The design originally figured on called for 84,000 tons.

Plate mills are running at a slower pace—now about 55 to 60 per cent. of capacity. For the three oil barges the American Shipbuilding Company is to build, 5000 tons of plates and shapes will be rolled at Pittsburgh.

The spring trade in wire products has gone beyond expectations. Some of the mills will be kept busy to the middle of the year on present bookings.

The implement companies are showing some interest in new bar contracts and the time honored arguments have come forward again for a preferential price to this class of buyers.

Railroad equipment orders continue to be given out in a grudging way. The Pittsburgh & Lake Erie contract for 1000 freight cars and 1000 gondolas will probably be placed this week. At Pittsburgh quite a little steel tie business is pending.

The tin plate mills are very busy. Those of the American Sheet & Tin Plate Company are running to 90 per cent. of capacity. Some orders are being placed for the third quarter, but the intimations that another advance may be made are not taken seriously.

The scale of sheet mill operations is somewhat disappointing.

Our Approaching Removal

The David Williams Company, publisher of *The Iron Age, Iron Age-Hardware, Metal Worker, Plumber and Steam Fitter* and *Building Age,* will remove its entire business from 14 Park place to 239 West Thirty-ninth street, between Seventh and Eighth avenues, New York City, and expects to be established in its new quarters in the week beginning April 10.

Several reasons have influenced the company when making this selection of a new habitation so far from the district in which it has so long conducted its operations. During the history of these various publications, the office has been frequently removed, but it has always been within a short distance of the central post-office. Convenience to the post-office was the prime consideration. This motive no longer applies, arrangements with the New York post-office now being in effect whereby our publications are sent directly to the Pennsylvania and New York Central trains without passing through the post-office. For some time many of the business interests of New York have found it advisable to seek locations further north in the city. The trend has been steadily in the direction of the district extending from Twenty-third street to Forty-second street. In this locality are found most of the important hotels, great retail stores and leading places of amusement. The out-of-town visitor finds himself in that locality more frequently than in any other part of the city. The recent opening of the great Pennsylvania Railroad station at Thirty-third street and Seventh avenue has emphasized this movement.

The new location of our office is almost midway between the Pennsylvania Railroad and New York Central stations and is within walking distance from either. It will therefore be easy of access to out-of-town visitors traveling on lines using these terminals. It will also be within easy reach of the great new post-office which will occupy a portion of the Pennsylvania Railroad Company's ground on Eighth avenue. An important advantage which will be gained will consist in having the printing office under the same roof with the business and editorial offices. Much inconvenience has been suffered for a long time in the separation of the mechanical and editorial departments, the printing office being at some distance. The new quarters will also afford much more room for the present working force, as well as provide ample space for growth, which, we are pleased to say, seems assured.

Visitors will be welcomed in the new quarters, as they always have been in the old ones. Ample provision will be made for them, including writing facilities for those living out of the city and who sometimes may find it difficult to secure conveniences of this kind while temporarily in the city. The files of our various publications and our extensive collection of trade catalogues will also be at their service for reference.

The Perennial Rail Problem

Another voluminous contribution to the discussion of rail failures and their causes was made last week at the Chicago convention of the Maintenance of Way Association. A mass of information gained from tests and from the investigation of rails was presented, some of it definite, much of it indefinite, but little of it conclusive. Such conclusions as were drawn pointed to the ingot as the source of nearly all defects, though the Rail Committee granted that the investigations should go further before any definite recommendations are made. Tests were carried out under the committee's direction to throw light on the claim commonly made on behalf of the rail mills that the head of a rail is broken down because of the excessive equipment loads of to-day, even though there be no physical defect in the interior of the rail head. The results are by no means as informing as might be hoped for and further experiments will be made to determine the maximum loads the various thicknesses of head will carry.

One thing appears plain from the vast array of statistics and test data at Chicago, and that is that some of the stringent requirements imposed upon the manufacturers in recent years did more to add to the difficulties of producing rails than to the wearing properties of the steel. It will be recalled that the minutiæ of rail mill practice were laid down in some specifications with great particularity. The size of the ingots was restricted, and the distance from the finishing rolls to the nearest hot saw and the time elapsing between the last pass and the arrival of the rail at the first saw were written into the specification as matters of high importance. We are now told that it is found on investigation that such things as speed and temperature of rolling, and the number of passes in reducing from the ingot to the rail, are of relatively little consequence.

It is quite evident from the recent investigations of railroad engineers and the lines on which they are now working for rail betterment, that the contests over

sections will be far less spirited in the future. The emphasis heretofore put on rolling practice and sections bids fair to be concentrated on the ingot, which is more and more being held primarily responsible for all the failures of rails in service. The Chicago report considers that it has been fairly well established that the making of safe rails of uniform structure and wearing properties "is almost entirely a matter of making a good ingot, free from excessive segregation, or of cropping off sufficient from the top to remove such excessive segregation."

Without desiring to enter upon the devious and interminable ramifications of the rail discussion, it may be fairly said that as it stands to-day the question of rail quality is as much a commercial one as a technical one. The diseases of steel ingots are quite well known. The railroad engineers have their minds pretty well made up as to the means they would take to keep out of track rails into which ingot weaknesses have been carried. They want rails rolled from a smaller portion of the ingot than has been used heretofore, but they have not thus far been willing to pay the steel makers for the additional discard. They are willing to accept only a part of the rails rolled from the selected portion of the ingot, not conceding as yet the point that first and last they must pay for all the rails that are rolled subject to their selection under the practice developed in years of rail mill improvement. Rails are a constantly decreasing percentage of the steel production of the country—only about 12 per cent. of the ingots produced in the United States in 1910 went into rails, against more than 90 per cent. in 1880, 40 per cent. in 1890 and 25 per cent. in 1900. It would seem highly important, therefore, from the railroad standpoint, that rail rolling be made a desirable business. If special quality steel is to be required for rails, it will naturally carry with it the payment of a special quality price. Other demands for steel are being constantly met in a satisfactory way, while railroad traffic imposes conditions which are peculiar to itself. There is no question as to the safety, soundness and wearing quality of far the greater part of the rails now furnished. The percentage of risk in the use of the remainder could be reduced by putting more metal into the rail—by the more common employment of 100-lb. or 110-lb., or even 125-lb. rails where traffic is heavy. Undeniably another step toward absolute safety would be the making of larger discards in rail blooming mills. Thus far apparently the railroads have not been satisfied that they were warranted in paying for such extra discards. In these two important particulars, therefore, the question at issue remains in large part a commercial one.

The New York Workmen's Compensation Decision

The decision of the New York Court of Appeals, declaring unconstitutional the workmen's compensation act of the State, deals no fatal blow to the principle, but has an extremely important significance in defining the conditions under which it may be constitutional. The decision, according to lawyers who are specializing on the subject, determines that workmen's compensation cannot lawfully exist, under our Constitution, in concurrent operation with present remedies, except where the right to elect between the remedies remains with the employer. Otherwise the property rights of owners are imperiled. Therefore, it is unconstitutional to give the injured workman the choice between two remedies: one being workmen's compensation, where the employer must pay predetermined damages in all cases of injury, and the other being employers' liability, existing as a basis of the Constitution under common law, where the employer is liable under certain conditions of negligence, and must pay damages, usually much larger, according to the finding of judge and jury.

Under the elective system, however, workmen's compensation, as it exists in New York and elsewhere, would be constitutional, because the employer would elect at the time of the employment of a workman which system should be resorted to in case the man were hurt or killed. A person applying for work would be informed that employers' liability was the rule of the works, or workmen's compensation, as the case might be. The applicant would either agree or he would have to seek work elsewhere. No choice would remain to him. He would have either all the advantages of workmen's compensation, with no alternative at common law, or he would be compelled to accept employers' liability, with no rights to compensation. This would preserve the property rights of the owner. It must either be this system or straight workmen's compensation all the way through, in which case it would be necessary to amend the Constitution. Until this constitutional idea has been embodied in compensation statutes they will doubtless be annulled when attacked in the courts. A different condition exists in Great Britain, that country having no constitution, its Parliament being all powerful in creating laws. A constitution is an instrument of government which even lawmakers are obliged to respect.

Underground Shops in South African Mines

Experiments that are expected to create a new demand for mechanical equipment are being conducted in several of the South African gold mines with a view to establishing underground shops for sharpening drilling tools. Many of the mine shafts in South Africa are nearly 4000 ft. deep, and at present it is necessary to carry drill rods to the surface for repairs or sharpening. When it is considered that many of the pneumatic drilling machines used in the mines require five and six sets of drill rods, numbering sometimes as many as 60 rods to a machine, it can be realized that the haulage up and down is considerable of an item. The work of conveying this equipment to the surface is, in fact, so expensive that in many mines it has been cheaper to hire native hammer boys than to use pneumatic drills.

Labor has steadily become more expensive, however, so that hand drilling is now approaching the cost of operating and maintaining pneumatic tools. Prominent mining engineers in South Africa believe that electric furnaces and electrically operated sharpening tools can be utilized in shops established underground. This would do away with the expensive hoisting of material. Experiments so far conducted in that direction are stated to have proved successful. Attempts have been made to install oil burning furnaces and gasoline operated sharpening equipment, but the Government has put a stop to this practice. No objection

has been raised, however, to the use of electrical equipment.

In many sections of the South African mining country adequate electrical power will shortly be available and at a cost much lower than at present. It will also be possible to increase the efficiency of the compressor plants. With the completion of these power developments and the introduction of underground shops for drill sharpening, it is expected that the Kaffir hammer boys will cease to be an important factor in mining operations, as these improvements will tip the balance in favor of the pneumatic drill. Accordingly, American manufacturers of rock drilling equipment, as well as makers of electric furnaces, are watching South African developments closely, as the demand for such equipment is expected to increase materially.

Correspondence

The Work of the Efficiency Specialist

To the Editor: The statement has been made that many of the articles by efficiency engineers are disappointing to the business man because they do not contain specific information as to details which he can transplant bodily to his own organization. That the business man is so disappointed is because he persists in taking a restricted view of a rich and wide subject. He wants to buy the knowledge which some have acquired by large expenditures of time and money, for the price of a few magazine articles. This he can never do. He must either buy the books which specialists have bought, and which are for sale in the open market, must devote to their study hours on hours of the time when his mind is most active (and hence most valuable in the conduct of his own affairs), must develop and stimulate his imaginative faculties (for in these are the real source of creative power), or he must do what he does in every other line—pay for the work which he is either unable or unwilling to do for himself.

No business man can delegate to others the actual decision as to the line of work he will engage in or the steps which he should take to carry out his desires. Each decision, however, should be based on the composite chosen advice of those who have made the individual investigations and performed the individual acts for which they were especially qualified.

The physician or the lawyer is not concerned with the selection of the line of business in which a client is engaged. Their interest is in putting him in the proper physical or mental condition in which he can conduct this business to the best advantage. The same thing is true of the efficiency engineer. The client may fill his office to the ceiling with books on medicine, law or efficiency, but until he has acquired mental possession of the information it is an absolute impossibility for him to diagnose correctly his own case, to select the proper remedy or advantageously to direct its application.

This is the function which the professional man is qualified to perform. The business man, by the exercise of his proper function, can earn the amount of the requisite fees with far less effort than that which would be necessary in order to qualify himself to perform the same service. This is the cold blooded business view of the situation. The object, therefore, of the articles written by efficiency engineers is to convince the business man of the necessity for such services, rather than to educate him to perform them himself. Until business men quit dosing themselves with patent medicine "systems" and are ready to take and pay for the advice of competent specialists, they cannot expect materially to improve their conditions. The competent physician will never intrust the application of his carefully devised remedies to the untrained judgment of a novice, still less to the subordinate of a novice.

The average business man actually wastes every year more than $10 which the specialist could save him at a cost of $1. There are none so blind as those who will not see. The consumer pays the bill at present; he will not do so much longer. H. F. STIMPSON.

NEW YORK, March 23, 1911.

Industrial Accident Inspection and Prevention

To the Editor: I have read with much interest your recent editorial on "Anti-Accident Inspection Service," also communications in your columns on the same subject.

I spent several months last summer in Europe investigating the operation of the workmen's compensation acts of the various countries and also in studying the problem of accident prevention. I was most impressed with what has been accomplished in Germany. The Germans have outstripped all nations in their devices for the prevention of accidents. Every safety device in a German factory is painted a bright red, which calls particular attention to it and which insures its being kept in place and in use, as either the foreman or fellow workman can quickly detect whether it is in its place or not.

I most thoroughly believe in an additional inspection service. In Minnesota our factory inspection is entirely inadequate. The inspection given by the liability insurance companies is very much better. For some years I have thought the solution of these matters lay in a moderate workman's compensation law; or rather, an industrial insurance scheme to which both the employer and employee contributed, the insurance being carried in mutual organizations of employers, or employers and employees. I believe this would operate as it does in Germany, to make both employers and employees exercise the greatest degree of care in the prevention of accidents.

State factory inspection in most States is a farce. Appointees are named to pay political debts. In Germany, both employers and employees are interested in reducing the number of accidents. Both are interested in using every precaution against accident, and in the mutual employers' organizations the premiums are based on not only the hazard of the occupation, but the care exercised in the particular factory to prevent accident. I am satisfied that one-half the industrial accidents which now occur are preventable. Rotten State inspection is responsible for a good many of them; the indifference of employers, resulting from a lack of discrimination by insurance companies between careless and careful employees, is in part responsible, and the polyglot character of workmen employed is in a lesser degree responsible for our existing number of accidents. Where the nationalities are mixed they do not think alike or act alike. I am heartily with you in any attempt to better State inspection, inspection by the employers themselves, inspection by the insurance companies, and independent inspection by an anti-accident inspection bureau.

Our company (the Minneapolis Steel & Machinery Company) has the following notice posted conspicuously throughout its shops:

"This company desires the safety of its employees and is anxious to provide every safeguard to prevent accidents. Workmen are instructed to call attention to any dangerous appliance or method, and are requested to offer any suggestions they may have as to safeguards or safety appliances. Such suggestions will be gladly received." GEORGE M. GILLETTE.

MINNEAPOLIS, MINN.

The new ore boat of the Jones & Laughlin Steel Company, to be known as the Thomas Walters, and to take the place of the W. C. Moreland, was launched last week at the shipyard of the American Shipbuilding Company, at Lorain, Ohio. The boat is 600 ft. long, 58-ft. beam and 32-ft. draft. This and its companion vessels, the Willis L. King, the B. F. Jones and the J. M. Laughlin, make up the four ships of the company's fleet.

The Continental Can Company, Canonsburg, Pa., will erect a storage and shipping building, 85 x 130 ft., and a machine shop, 50 x 100 ft.

Italy's Greatest Steel Plant

BY A SPECIAL CORRESPONDENT.

The principal factor which contributed to the establishment of this steel plant, which is the largest in Italy and one of the most modern on the continent, was the act passed by the Italian Parliament July 8, 1904, for the uplifting and betterment of the people of the south of Italy and especially of Naples. This act permitted the entry in Italy free of customs duty and taxes for 10 years of all the machinery and material necessary to build a large plant. It also permitted the lessee of the Government iron ore deposits, situated in the historic island of Elba, to mine a much larger quantity of ore per annum.

The Societa Anonima Ilva, which gets its name from the ancient name of Elba, was incorporated in Genoa in 1905 with a capital of 30,000,000 Italian lires (about $6,000,000). The corporation possesses 1,200,000 square metres (675 acres) of land in Bagnoli, five kilometres (3.1 miles) from Naples, with a good area on the sea front. The plant is divided into four principal units: By-product coke ovens, blast furnaces, open hearth steel furnaces and rolling mills.

Awaiting the completion of the new railroad between Rome and Naples, which will pass within a few yards of the works, the plant is able to receive material and ship its product by sea. For this purpose the company has built a reinforced concrete wharf, 320 metres (1050 ft.) long and 30 metres (98 ft.) wide, on which are in service eight electric cranes and four steam cranes. The land on which the plant was built does not afford a good foundation for such heavy structures as the blast furnaces, so it was found necessary to drive long reinforced concrete piles on which to build. The lava of Mount Vesuvius was found very useful in the concrete foundations.

The coal, which arrives by sea, is stored in dumps, which can hold 50,000 tons. These run parallel to the coke ovens. They are served by four 5-ton electric cranes. The by-product coke ovens, 120 in number, are of the regenerator type and are divided into two groups. The coke, gas mixed with the blast furnace gas, is sent into two 30,000 c. m. (700,000 cu. ft.) gasometers, which in turn distribute the gas to the boilers to the power house and to the open hearth department. The ovens consume daily 800 tons of coal and produce 650 tons of coke, 14 tons of tar and 8 tons of ammonium sulphate.

The ore dumps, which are immense, are parallel to the blast furnaces and have five 5-ton electric cranes which take the ore from the dumps to 10 500-ton ore bunkers, under which pass two tunnels. In the tunnels are two electric cars which carry on them large hooked buckets called kubels, the bottoms of which are conical so as to allow the material to fall into the furnace. The kubels are raised to the tops of the furnaces by inclined elevators. The coke is also carried directly from the coke ovens on electric cars in kubels. The ore of the island of Elba is high in iron and only contains traces of sulphur and phosphorus. The limestone comes from the picturesque peninsular of Sorrento where the company operates a quarry.

The first blast furnace was blown in December 1, 1909, the second was blown in May 8, 1910, and a third is in process of construction. When the plant is completed it will consist of six blast furnaces with a daily capacity of 250 tons each.

The power house contains two gas and two steam blowing engines of 1500 hp. each, one 4-cycle gas engine direct connected to a 1200-kw. generator, two 2-cycle gas engines direct connected to two 600-kw. generators, and one steam engine direct connected to a 1250-kw. generator.

The open hearth department will comprise when completed 10 55-ton American type furnaces and two 300-ton Wellman-Seaver-Morgan metal mixers. There are three Pöttter gas-producers for each furnace, and in case of need room has been left for a fourth. There are two 90-ton electric ladle cranes and two 40-ton ladle cranes for the hot metal. There are also three 20-ton service cranes and two Wellman-Seaver-Morgan electric ingot strippers. The ingots can be cast up to 5 tons. Two gas ingot pits and two coal ingot pits heat the ingots for the blooming mill. There are also such auxiliaries of the open hearth department as the dolomite calcining and fire brick factory.

The blooming mill, with rolls of 1150 millimetres (45.27 in.) diameter, is driven by an 8000 hp. reversible steam engine, while the rail mill is driven by a 10,000-hp. and a 7000-hp. engine. Other mills, such as plate mills and merchant mills, will be erected shortly.

There is also a 62 metre (203.4 ft.) water tower reservoir for the sea water for cooling the blast furnaces.

The corporation is managed by an Executive Committee which is composed of the following: Marquis Durazzo Pallavicini of Genoa, chairman; Comm. Cesaro Fera, M.E., of Genoa; Cav. George Falck of Milan, Hon. Arthur Luzzatto, M.E., of Rome. The last named, who is a member of the Italian Parliament, was in the United States in March, 1910, when he visited some of the most important American plants, such as Gary, South Chicago, Homestead, &c.

The Standard Scale & Supply Company, Pittsburgh, recently took an unusual method to insure quick shipment of one of its Eclipse concrete mixers from its Chicago warehouse, to Gary, Ind., a distance of 30 miles. A mixer in use there had broken down and it was necessary to have another machine by the morning of the following day. The railroads could not guarantee delivery by freight, and the mixer, which was mounted on a truck equipped with a gasoline engine, was too large to be loaded in an express car. An automobile moving van was secured and the complete mounted outfit was loaded upon it at 6 o'clock in the evening. By 8 o'clock the next morning the journey by country road was completed and the machine was delivered at Gary.

The New York Fire Department has received from the Nott Fire Engine Company, Minneapolis, Minn., an auto fire engine. This engine propels itself with a gasoline motor guaranteed to give a speed of 30 miles an hour, while the pump is operated by the usual steam engine. All parts of this engine are specially made and represent experimental work of nearly four years. The test of the engine is stated to have been completely successful.

The Carnegie Steel Company has under consideration the erection of an open hearth steel plant at its Edgar Thomson Works to comprise probably 12 50-ton furnaces. For some time the company has been taking open hearth ingots from its Homestead Works to the Edgar Thomson Works and reheating them for rolling into rails. Bids have been asked on the erection of 15 gas producers for the proposed improvement, but an actual decision in regard to building the plant has not yet been reached.

Dynamiters wrecked the Erie Railroad ore bridge at Randall, Ohio, near Cleveland, March 25, causing a loss of $90,000. The bridge was recently completed, having been erected by Heyl & Patterson, Pittsburgh. It was equipped with a 10-ton bucket. The outrage is attributed to labor troubles. The bridge was a part of a new ore handling plant, which was operated by Pickands, Mather & Co. The bridge will probably be rebuilt as soon as possible.

The Colonial Supply Company has been organized to deal in mill supplies and has opened offices and a warehouse at 414 First avenue, Pittsburgh. Most of its members were formerly connected with the C. A. Turner Incorporation. Willis Barson is president; Carl T. Haller, vice-president; H. W. Dinker, treasurer, and H. B. Lacey, secretary.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Mar.29, 1911.	Mar.22, 1911.	Feb.21, 1911.	Mar.30, 1910.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	$15.50	$15.50	$15.50	$18.00
Foundry No. 2, Valley furnace	13.75	13.75	13.75	16.00
Foundry No. 2, Southern, Cincinnati	14.25	14.25	14.25	15.75
Foundry No. 2, Birmingham, Ala.	11.00	11.00	11.00	12.50
Foundry No. 2, local, Chicago	15.50	15.50	15.50	18.00
Basic, delivered, eastern Pa.	15.25	15.25	14.50	17.75
Basic, Valley furnace	13.75	13.75	13.75	16.00
Bessemer, Pittsburgh	15.90	15.90	15.90	18.40
Gray forge, Pittsburgh	14.40	14.40	14.40	16.15
Lake Superior charcoal, Chicago	17.50	17.50	17.50	19.00
COKE, CONNELLSVILLE, Per Net Ton, at oven:				
Furnace coke, prompt shipment	**1.60**	1.55	1.45	2.00
Furnace coke, future delivery	1.75	1.75	1.60	2.25
Foundry coke, prompt shipment	2.00	2.00	2.00	2.50
Foundry coke, future delivery	2.25	2.25	2.25	2.75
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	23.00	23.00	23.00	27.50
Forging billets, Pittsburgh	28.00	28.00	28.00	32.00
Open hearth billets, Philadelphia	25.40	25.40	25.40	30.60
Wire rods, Pittsburgh	29.00	29.00	29.00	33.00
OLD MATERIAL, Per Gross Ton:				
Iron rails, Chicago	14.50	14.50	15.50	19.00
Iron rails, Philadelphia	18.50	18.50	18.00	20.50
Car wheels, Chicago	13.25	13.25	13.00	17.00
Car wheels, Philadelphia	14.00	14.00	14.00	16.75
Heavy steel scrap, Pittsburgh	14.00	14.00	14.75	17.00
Heavy steel scrap, Chicago	*11.50*	12.00	12.50	15.00
Heavy steel scrap, Philadelphia	*13.75*	14.00	14.50	16.50
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia	1.37½	1.37½	1.37½	1.55
Common iron bars, Chicago	1.27½	1.27½	1.30	1.55
Common iron bars, Pittsburgh	1.35	1.35	1.35	1.65
Steel bars, tidewater, New York	1.56	1.56	1.56	1.61
Steel bars, Pittsburgh	1.40	1.40	1.40	1.45
Tank plates, tidewater, New York	1.56	1.56	1.56	1.71
Tank plates, Pittsburgh	1.40	1.40	1.40	1.55
Beams, tidewater, New York	1.56	1.56	1.56	1.66
Beams, Pittsburgh	1.40	1.40	1.40	1.50
Angles, tidewater, New York	1.56	1.56	1.56	1.66
Angles, Pittsburgh	1.40	1.40	1.40	1.50
Skelp, grooved steel, Pittsburgh	1.30	1.30	1.30	1.50
Skelp, sheared steel, Pittsburgh	1.35	1.35	1.35	1.60
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.20	2.20	2.20	2.40
Wire nails, Pittsburgh*	1.80	1.80	1.75	1.85
Cut nails, Pittsburgh	1.70	1.70	1.60	1.85
Barb wire, galv., Pittsburgh*	2.10	2.10	2.05	2.15
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	12.50	12.50	12.75	13.75
Electrolytic copper, New York	12.25	12.25	12.37½	13.25
Spelter, New York	*5.60*	5.65	5.60	5.65
Spelter, St. Louis	*5.45*	5.50	5.45	5.50
Lead, New York	**4.45**	4.40	4.42½	4.40
Lead, St. Louis	**4.30**	4.25	4.27½	4.25
Tin, New York	**41.25**	40.50	44.75	33.25
Antimony, Hallett, New York	9.12½	9.12½	8.00	8.25
Tin plate, 100-lb. box, New York	$3.94	$3.94	$3.94	$3.84

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter, 65c. on wrought boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c., net; I-beams over 15 in., 1.50c. to 1.55c., net; H-beams over 8-in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c., net; angles over 6 in., 1.50c. to 1.55c., net; angles, 3 in., on one or both legs, less than ¼ in. thick, 1.45c., plus full extras as per steel bar card effective September 1, 1909; tees, 3 in. and up, 1.45c., net; zees, 3 in. and up, 1.40c. to 1.45c., net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c., net; hand rail tees, 2.50c.; checkered and corrugated plates, 2.50c., net.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¾-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, U. S. standard gauge, 1.55c.; Nos. 9 and 10, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 1.85c. One pass, cold rolled, box annealed sheets, Nos. 10 to 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 1.95c.; Nos. 17 to 21, 2c.; Nos. 22, 23 and 24, 2.05c.; Nos. 25 and 26, 2.10c.; No. 27, 2.15c.; No. 28, 2.20c.; No. 29, 2.25c.; No. 30, 2.35c. Three pass, cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 2.05c.; Nos. 17 to 21, 2.10c.; Nos. 22 to 24, 2.15c.; Nos. 25 and 26, 2.20c.; No. 27, 2.25c.; No. 28, 2.30c.; No. 29, 2.35c.; No. 30, 2.45c. Galvanized sheets, Nos. 10 and 11, black sheet gauge, 2.20c.; Nos. 12, 13 and 14, 2.30c.; Nos. 15, 16 and 17, 2.45c.; Nos. 18 to 22, 2.60c.; Nos. 23 and 24, 2.70c.; Nos. 25 and 26, 2.90c.; No. 27, 3.05c.; No. 28, 3.20c.; No. 29, 3.30c.; No. 30, 3.50c. Painted roofing sheets, No. 28, $1.55 per square. Galvanized sheets, No. 28, $2.75 per square for 2½-in. corrugations. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1;

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
Butt Weld.				
1 to 1½ in	49		43	
¼ in	75	63	71	59
⅜ to 1½ in	79	69	75	65
2 to 3 in	80	70	76	66
Lap Weld.				
2 in	76	66	72	62
2½ to 4 in	78	68	74	64
4½ to 6 in	77	67	73	63
7 to 12 in	75	59	71	55
13 to 15 in	51½	..	..	..
Butt Weld, extra strong, plain ends, card weights.				
⅛, ¼, ⅜ in	69	59	65	55
½ in	74	68	70	64
¾ to 1¼ in	78	72	74	68
2 to 3 in	79	73	75	69
Lap Weld, extra strong, plain ends, card weight.				
2 in	75	69	71	65
2½ to 4 in	77	71	73	67
4½ to 6 in	73	70	72	66
7 to 8 in	69	59	65	55
9 to 12 in	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
¼ in	64	58	60	54
⅜ to 1¼ in	67	61	63	57
2 to 3 in	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in	65	59	61	55
2½ to 4 in	67	61	63	57
4½ to 6 in	66	60	62	56
7 to 8 in	59	49	55	45

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Plugged and Reamed.

1 to 1½, 2 to 3 in.	Butt Weld	Will be sold at two (2) points lower basing (higher price) than merchant or card weight pipe, Butt or Lap Weld as specified.
2, 2½ to 4 in.	Lap Weld	

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1½ in.	49	43
1¾ to 2¼ in.	61	43
2½ in.	63	48
2¾ to 5 in.	69	55

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods and Wire.—Bessemer, open hearth and chain rods, $29 to $30 per gross ton. Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed $1.60, galvanized $1.90; carload lots, to retailers, annealed $1.65, galvanized $1.95. Galvanized barb wire, to jobbers, $2.10; painted, $1.80. Wire nails, to jobbers, $1.80.

The following table gives the prices to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 Lb.

Nos.	0 to 9	10	11	12&12½	13	14	15	16
Annealed	$1.75	1.80	1.85	1.90	2.00	2.10	2.20	2.30
Galvanized	2.05	2.10	2.15	2.20	2.30	2.40	2.80	2.90

Market and Stone Wire in Bundles, Discount from Standard List.

Bright and Annealed:	
9 and coarser	80
10 to 18	80 and 10
19 to 26	80 and 10 and 2½
27 to 36	80 and 5
Galvanized:	
9 and coarser	75 and 10
10 to 16	75 and 10
17 to 26	72½ and 10
27 to 36	72½
Coppered or Liquor Finished:	
9 and coarser	75 and 10
10 to 26	75 and 10
27 to 36	70 and 10 and 5
Tinned:	
6 to 18	75 and 10 and 10

Steel Rivets.—Structural rivets, ¾ in. and larger, 1.90c., base; cone head boiler rivets, ¾ in. and larger, 2c., base; ⅝ in. and 11-16 in. take an advance of 15c., and ½ in. and 9-16 in. take an advance of 50c.; in lengths shorter than 1 in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

Pittsburgh

PARK BUILDING, March 29, 1911.—(*By Telegraph.*)

Pig Iron.—A moderate tonnage of foundry and malleable Bessemer iron is being sold, but standard Bessemer and basic continue neglected. The Westinghouse Electric & Mfg. Company has bought 1500 tons of No. 2 foundry for delivery at Trafford City at a price that figures out less than $14, Valley furnace, the iron coming from a nearby furnace that has a lower freight than 90c., the Valley rate. The Union Switch & Signal Company, another Westinghouse interest, has bought about 750 tons more of No. 2 foundry for third quarter at about $13.85, Valley furnace. The McClintic-Marshall Construction Company is in the market for 1400 tons of low grade iron which, it is understood, is to be used for ballast in boats for transporting material to the Panama Canal, where the company is doing a large amount of work. We quote Bessemer pig iron, $15; malleable Bessemer, $13.75; basic, $13.75 to $14; No. 2 foundry, $13.75 to $14, and gray forge, $13.50, all at Valley furnace, the freight rate to the Pittsburgh district being 90c. a ton.

Steel.—Makers of billets and sheet and tin bars are now quoting present prices for delivery through the third quarter. Specifications against contracts for steel are coming in freely, but the new demand is light, as consumers are covered by sliding scale and other forms of contracts. A sale is reported of 1000 tons of 4 x 4 in. open hearth billets for second quarter delivery at $23, Pittsburgh. We quote Bessemer and open hearth billets, 4 x 4 in. and up to, but not including, 10 x 10 in., at $23, base, and sheet and tin bars in 30-ft. lengths, $24, f.o.b. Pittsburgh or Youngstown, full freight to destination added. We quote 1½-in. billets at $24 and forging billets at $28, base, usual extras for sizes and carbons, f.o.b. Pittsburgh or Youngstown districts, freight to destination added.

(*By Mail.*)

Consumers are still pursuing the policy of buying only what they absolutely need. Current orders are fairly active but are only for small lots. The railroads are practically out of the market, and this of course is severely felt. Little new inquiry is coming up for steel cars or rails, and some inquiries for cars that were pending three or four weeks ago have been withdrawn. In the pig iron the only activity is in foundry grades, some fair sized sales having been made in the past week. There is not much new inquiry for steel, consumers of billets and sheet and tin bars being covered by contracts. The Carnegie Steel Company and other makers of billets and bars are now taking contracts for delivery up to July 1 at present prices. The situation in finished iron and steel is quiet, and on a general average the mills are not running to more than 65 to 70 per cent. of capacity. The wire trade is active, one leading maker stating that it is sold up for the next three months, and not actively seeking new business. The coke market is slightly stronger, but there is not much new inquiry. The scrap trade is neglected, consumers not being interested in the market, except at low figures that the dealers will not consider.

Ferromanganese.—Sales of about 100 tons of foreign 50 per cent. for second quarter delivery have been made at about $37.25, Baltimore, and sales of 200 to 300 tons in small lots are reported for April delivery. An inquiry is in the market for 300 tons for second half. We quote 50 per cent. foreign at $37 to $37.25 for spot shipment, and about $37.25 to $37.50 for second half of the year, f.o.b. Baltimore, the freight rate to Pittsburgh being $1.95 a ton.

Ferrosilicon.—Prices are reported to be a shade firmer, but new inquiries are light and only for small lots. Most large consumers are covered and are out of the market. We quote 50 per cent. at $53.50 to $54, f.o.b. Pittsburgh, for delivery up to July; 10 per cent. blast furnace silicon, $23; 11 per cent., $24, and 12 per cent., $25, f.o.b. cars, Jisco and Ashland furnaces.

Muck Bar.—It is reported that 500 tons of standard grade muck bar were sold last week to a local consumer at a price equal to about $29, delivered. We quote best grades of muck bar, made from all pig iron, at $29 to $29.50, Pittsburgh.

Skelp.—A sale of 600 tons of grooved steel skelp for April and May delivery is reported on the basis of 1.30c., delivered buyer's mill, Pittsburgh. New demand is quiet, as the pipe mills that buy skelp in the open market are pretty well covered for some time ahead. We quote grooved steel skelp at 1.30c.; sheared steel skelp, 1.35c.; grooved iron skelp, 1.60c. to 1.65c., and sheared iron skelp, 1.70c. to 1.75c., all for delivery at consumers' mills in the Pittsburgh district, usual terms.

Wire Rods.—The market is quiet, new inquiry being light and only for small lots. Specifications against contracts are not coming in very well. The new rod mill of the Cambria Steel Company is making good records in output. We quote Bessemer, open hearth and chain rods at $29 to $30, Pittsburgh, most sellers asking the higher price.

Steel Rails.—No orders for standard sections of any moment were received by the Carnegie Steel Company last week, aside from two or three fairly large orders for export. This company reports quite an active demand for light rails, and in the past week received new orders and specifications against contracts for about 4000 tons. It is also receiving good inquiries for splice bars, and has just about closed an important contract with a Southern road for a large tonnage. The demand for steel ties is fairly active. Prices on light rails are as follows: 12-lb. rails, 1.25c.; 16, 20 and 25 lb., 1.21c. to 1.25c.; 30 and 35 lb., 1.20c., and 40 and 45 lb., 1.16c. The prices are f.o.b. at mill, plus freight, and are the minimum of the market on carload lots, small lots being sold at a little higher price. Standard sections are held at 1.25c. per pound.

Plates.—Two of the leading car builders report that in the past week they have not taken a single order for steel cars. The only new inquiry in the market, aside from those noted in this report last week, is one from the Chicago, Burlington & Quincy for 500 60,000-lb. refrigerator cars. The Pittsburgh & Lake Erie Railroad is expected to place contracts for 2000 steel cars within the next week or 10 days. It is also said that the Western Maryland Railroad will soon buy 500 steel hoppers, and the Buffalo Creek Railroad is inquiring for 100 hopper cars. The American Shipbuilding Company, Lorain, Ohio, has received contracts for several steel barges for the Standard Oil Company, each of which will require 1600 to 1800 tons of plates, that will be rolled by the Carnegie Steel Company. All the leading plate mills are badly in need of work, and none of them is operating to more than 50 to 60 per cent. of capacity. We quote ¼-in. and heavier plates at 1.40c., Pittsburgh.

Structural Material.—The American Bridge Company

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has taken 700 to 800 tons of bridge work for the Pere Marquette Railroad. Very little local work is being placed, but east and west of Pittsburgh conditions are quite active. Bookings of that company this month will show a heavy increase over February. We quote beams and channels up to 15 in. at 1.40c., Pittsburgh.

Tin Plate.—Conditions in this trade continue active. The American Sheet & Tin Plate Company is now operating close to 90 per cent. of its hot mill capacity. Specifications against contracts are coming in very freely. The leading tin plate mills are entering orders for shipment up to July 1 at present prices, and it is also stated that some business has been entered for third quarter delivery on the same basis. Prices are firm and we quote 100-lb. cokes at $3.70 per base box, f.o.b. Pittsburgh.

Sheets.—Slight betterment in the new demand for sheets from some sections is reported, but the general condition of the trade is unsatisfactory, both from the standpoint of new orders and specifications against contracts. It is estimated that not over 65 per cent. of sheet mill capacity is active at present. While prices are fairly well maintained, they are sometimes slightly shaded in exceptional cases, particularly in the Southwest. Prices in effect on the different grades of sheets are printed on a previous page.

Bars.—A fair current demand is being received for steel bars, and specifications from large consumers are quite good. The implement makers are finally commencing to show some interest in the market; while no contracts have yet been placed for the year commencing July 1, it is believed there will be something done in the near future. In the preliminary negotiations, the implement makers have again raised the point that large consumers are entitled to a lower price on their steel bars than the smaller buyers. Prices on iron bars are slightly firmer, and the rate of operations among the mills is a little heavier. We quote steel bars at 1.40c. and common iron bars at 1.35c. to 1.40c., Pittsburgh.

Shafting.—The new demand is reported to be a little better, and specifications on contracts are coming in more freely. Regular discounts on cold rolled steel shafting, which are 57 per cent. off in carloads and 52 per cent. in less than carloads delivered in base territory, are sometimes slightly shaded.

Spelter.—Prices continue weak, and the demand is light. We quote prime grades of Western at 5.37½c. to 5.40c., East St. Louis, equal to 5.50c. and 5.52½c., Pittsburgh.

Merchant Steel.—The new demand is reported slightly better, and specifications against contracts this month have been about as heavy as in February, which was regarded as a fairly good month. We quote the higher grades of merchant steels, f.o.b. Pittsburgh, as follows: Iron finished tire, ½ x 1½ in. and heavier, 1.40c., base; under these sizes, 1.75c.; planished tire, 1.60c.; channel tire, 1.80c., base; toe calk, 1.90c.; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finish, 1.90c.

Rivets.—Regular prices on rivets have been reaffirmed. The new demand is reported as fairly active, but mostly for small lots, while specifications against orders are moderate. Prices of 1.90c. on structural rivets and 2c. on boiler rivets are sometimes shaded on desirable business.

Wire Products.—The wire trade is probably the most active of any of the finished lines, the new demand for wire nails and wire being quite heavy, while specifications against contracts are coming in at a very satisfactory rate. One leading wire mill reports that it is practically sold up to July 1 and is not actively seeking new business. We quote galvanized barb wire at $2.10; painted, $1.80; annealed fence wire, $1.60; galvanized, $1.90; wire nails, $1.80, and cut nails, $1.70, f.o.b. Pittsburgh, full freight to destination added.

Spikes.—Two of the Southern railroads are in the market for spikes, one for 5000 and the other for 3000 kegs. The general demand is quiet and mostly for small lots. All new contracts for spikes for shipment after April 1 are said to be based on $1.60 per keg. Commencing April 1 prices on spikes will be as follows:

Railroad Spikes.

4½, 5 and 5½ x 9/16	$1.60
3, 3½, 4, 4½ and 5 x ½	Extra .10
3½, 4 and 4½ x 7/16	Extra .20
3, 3½, 4 and 4½ x ⅜	Extra .30
2½ x ⅜	Extra .40
2½, 3 and 3½ x 5/16	Extra .60
2 x 5/16	Extra .80

Boat Spikes.

¾ in. square, 12 to 24 in. long	Extra .15
⅝ in. square, 8 to 16 in. long	Extra .15
½ in. square, 6 to 16 in. long	Extra .15
7/16 in. square, 6 to 12 in. long	Extra .20
⅜ in. square, 4 to 12 in. long	Extra .30
5/16 in. square, 4 to 8 in. long	Extra .45
¼ in. square, 4 to 8 in. long	Extra .75
¼ in. square, 3 to 3½ in. long	Extra 1.00

⅜ and 5/16 shorter than 4 in., ¼ cent extra.

Merchant Pipe.—A gas interest at Los Angeles, Cal., is in the market for 68 miles of 8 to 10 in. steel line pipe. One of the Canadian pipe mills has taken an order for about 10 miles of 6-in. and 3 miles of 6 to 8 in., for delivery in Canada. The current new demand for merchant pipe is fairly active, but is still confined to small lots to cover actual needs. On a general average, the pipe mills are operating to about 60 to 65 per cent. of capacity. Discounts on both iron and steel pipe, printed on a previous page, are reported as well maintained.

Boiler Tubes.—Most of the leading consumers of boiler and locomotive tubes have contracted for their supply for the remainder of this year, but specifications are not coming in as well as desired. New buying is dull and is only for small lots. A new discount list on tubes, carrying a readjustment on certain sizes, has recently been adopted by several makers.

Hoops and Bands.—The new demand continues light and is mostly for small lots to cover actual needs. Specifications against contracts are not coming in well, and in some cases have been held up entirely. We quote steel hoops at 1.50c., and bands at 1.40c., extras on the latter as per the present steel card.

Iron and Steel Scrap.—The scrap market is about at a standstill, consumers being pretty well covered and only willing to consider offers at very low prices, which in most cases the dealers are turning down. It is said that there is quite a large short interest in the market, and this is helping to sustain prices to some extent. A sale of about 500 tons of heavy steel scrap for delivery at Monessen, Pa., is reported on the basis of $14 per gross ton. Prices on borings and turnings continue weak, the two leading consumers in the Pittsburgh district being covered for some time ahead and refusing to take in more material than specified in their contracts. Dealers quote as follows, f.o.b. Pittsburgh, or elsewhere as noted, per gross ton:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$14.00
No. 1 foundry cast	$14.00 to 14.25
No. 2 foundry cast	13.25 to 13.50
Bundled sheet scrap, at point of shipment	10.50 to 10.75
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	15.00 to 15.25
No. 1 railroad malleable stock	13.00
Grate bars	11.00
Low phosphorus melting stock	17.00 to 17.25
Iron car axles	24.25 to 24.50
Steel car axles	20.00 to 20.25
Locomotive axles	24.00
No. 1 busheling scrap	12.50 to 12.75
No. 2 busheling scrap	9.00 to 9.25
Old car wheels	13.50 to 13.75
Sheet bar crop ends	15.50 to 15.75
*Cast iron borings	9.00 to 9.25
*Machine shop turnings	10.00 to 10.25
Old iron rails	16.00 to 16.25
No. 1 wrought scrap	14.25 to 14.50
Heavy steel axle turnings	10.25
Stove plate	11.00 to 11.25

* These prices are f.o.b. cars at consumers' mill in the Pittsburgh district.

Coke.—There is a little more active inquiry for foundry coke, but not much doing in furnace coke, either in the way of prompt shipments or on contracts. A Valley furnace that has been shut down for about six months and is expected to start up next week is said not to have covered for its supply of coke. One leading maker of furnace and foundry coke is now quoting 72-hour high grade foundry coke for delivery over the remainder of the year, commencing April 1, on the basis of $2.40 per net ton, at oven. The output in the Upper and Lower Connellsville regions last week was about 360,000 net tons, a slight increase over the previous week. We quote standard makes of 72-hour foundry coke at about $2 for prompt shipment and $2.25 to $2.40 per net ton, at oven, for delivery over the remainder of the year. We quote standard makes of furnace coke for prompt shipment at $1.60 to $1.65, and for delivery over the next six months from $1.80 to $2 per net ton, at oven.

The Producers' Coke Company, Uniontown, Pa., reports that furnace coke contracts recently closed by it for prompt shipment totaled 85 cars, at $1.65 per net ton, at oven.

Chicago

FISHER BUILDING, March 29, 1911.—(*By Telegraph.*)

A dullness prevails in the entire market. Particularly noticeable is this inactivity in the pig iron market where there have been practically no new developments and specifications on contracts have been backward. There are rumors of price concessions on pig iron for third quarter delivery, but these are not borne out by actual trading nor can they be verified. The sale of light rails is slightly improved, and wire products are holding their own with the good record of recent weeks. Business has fallen off on bars, although prices are being well maintained. The scrap market seems

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to be without support, and has continued to weaken through the entire week, with more scrap constantly coming into sight.

Pig Iron.—The week under review has been one of extreme quiet. There are no inquiries of note, and specifications have been coming forward slowly. The only sales worthy of mention have culminated in and about Peoria, Ill., where about 2500 tons of Southern iron has been sold to agricultural industries for deliveries extending through the last half on the basis of $11.50, Birmingham. The following quotations are for April, May and June shipment, Chicago delivery:

Lake Superior charcoal	$17.50 to $18.00
Northern coke foundry, No. 1	16.00 to 16.50
Northern coke foundry, No. 2	15.50 to 16.00
Northern coke foundry, No. 3	15.25 to 15.75
Northern Scotch, No. 1	16.50 to 17.00
Southern coke, No. 1	15.85 to 16.35
Southern coke, No. 2	15.35 to 15.85
Southern coke, No. 3	15.10 to 15.60
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	15.85 to 16.35
Southern coke, No. 2 soft	15.35 to 15.85
Southern gray forge	14.60 to 15.10
Southern mottled	14.60 to 15.10
Malleable Bessemer	15.50 to 16.00
Standard Bessemer	17.40 to 17.90
Jackson Co. and Kentucky silvery, 6%	17.90 to 18.40
Jackson Co. and Kentucky silvery, 8%	18.90 to 19.40
Jackson Co. and Kentucky silvery, 10%	19.90 to 20.40

(By Mail.)

Billets.—No sales of note are reported this week. The leading interest is still maintaining the price of $30.60, base, Chicago. The price on open hearth rerolling billets continues at $25.60, base, Chicago.

Rails and Track Supplies.—The volume of light rail business has increased. Contracts averaging about 1500 tons weekly are being received by the leading interest. Railroad buying is quiet, and seems to be for immediate needs rather than in anticipation of future wants. There is an active demand for all kinds of lighter track supplies. Prices are firm, as follows: We quote standard railroad spikes at 1.70c. to 1.75c., base; track bolts with square nuts, 2.15c. to 2.25c., base, all in carload lots, Chicago. Standard section Bessemer rails, 1.28c.; open hearth, 1.34c. Light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12-lb., 1.25c. to 1.30½c., Chicago.

Structural Material.—New business has not been heavy this week, although specifications on contracts are coming in freely. The Rock Island Railroad has taken bids on 1700 tons of bridge material. Contracts let last week include the following: Wisconsin River Power Company, hydroelectric development near Prairie du Sac, Wis., 550 tons, let to Modern Steel Structural Company; roof construction for new cell house at State Penitentiary, Fort Madison, Iowa, 140 tons, to Fremont Turner, Des Moines, Iowa; Chicago, Terre Haute & Southwestern Railway Company, 207-ft. viaduct, Donovan, Ill., 186 tons, to American Bridge Company; Great Falls Iron Works, Great Falls, Mont., foundry building, crane runway, &c., 123 tons; Southwestern Telephone & Telegraph Company, building at Houston, Texas, 525 tons, to Noelke-Richards Iron Works, Indianapolis, Ind.; Chicago, Milwaukee & St. Paul Railway Company, Black River bridge in State of Washington, 145 tons, to Milwaukee Bridge Company. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—Plate mills are not running to their full capacity and business is a little slow. We quote mill prices at 1.58c. to 1.63c., Chicago; store prices 1.80c. to 1.90c., Chicago.

Sheets.—Mills are running at about three-fifths capacity, and there is no great volume of business in sight. From present indications sheet business this year promises to be below normal. Prices are being well maintained. We quote Chicago prices, carload lots, from mill: No. 28 black sheets, 2.38c.; No. 28 galvanized, 3.38c.; No. 10 blue annealed, 1.83c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.15c. to 2.25c.; No. 28 black, 2.75c. to 2.85c.; No. 28 galvanized, 3.65c. to 3.75c.

Bars.—Bar iron prices in this market are being better maintained than for several months. This is not taken as an indication of any great increase in business. It shows that former prices were based on the desire to get business rather than a careful figuring of costs. Steel bars are not as active as last week. Prices are being well maintained and are as follows: Soft steel bars, 1.58c.; bar iron, 1.27½c. to 1.32½c.; hard steel bars rolled from old rails, 1.35c. to 1.40c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Wire Products.—The activity usually expected with the opening of spring work prevails in the wire market. Liberal buying is reported from every direction. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.78c.; wire nails, 1.98c.; painted barb wire, 1.98c.; galvanized, 2.28c.; polished staples, 1.98c.; galvanized, 2.28c., all Chicago.

Cast Iron Pipe.—The principal contracts closed in this market by the leading interest have been 1000 tons, Columbus, Ohio; 500 tons, Dayton, Ohio; 500 tons, Muscatine, Iowa, and 400 tons, Kansas City, Kan. In addition about 1000 tons of new business has been booked from numerous smaller sources. Inquiries are fairly free and prices remain firm, per net ton, Chicago: Water pipe, 4-in., $25.50; 6 to 12 in., $24.50; 16-in. and up, $24, with $1 extra for gas pipe.

Old Material.—Mills seem to be pretty well supplied and are naming their own prices. Evidence of large stocks continues to come to light, and this week the Rock Island is out with a list totaling 2900 tons, which closes March 28. The principal item on this list is 700 tons of No. 1 wrought. The Chicago, Burlington & Quincy's list of last week was sold, and a price of $11.35, f.o.b. seller's tracks, was paid for the railroad malleable. The entire scrap market seems to be without support. Prices are for delivery to buyers' works, all freight and transfer charges paid, and are as follows per gross ton:

Old iron rails	$14.50 to $15.00
Old steel rails, rerolling	13.25 to 13.75
Old steel rails, less than 3 ft	12.75 to 13.25
Relaying rails, standard sections, subject to inspection	23.00 to 24.00
Old car wheels	13.25 to 13.75
Heavy melting steel scrap	11.50 to 12.00
Frogs, switches and guards, cut apart	11.75 to 12.25
Shoveling steel	11.25 to 11.75

The following quotations are per net ton:

Iron angles and splice bars	$12.50 to $13.00
Iron arch bars and transoms	14.00 to 14.50
Steel angle bars	11.00 to 11.50
Iron car axles	19.00 to 19.50
Steel car axles	18.00 to 18.50
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	10.50 to 11.00
Steel knuckles and couplers	11.00 to 11.50
Locomotive tires, smooth	17.00 to 17.50
Steel axle turnings	8.00 to 8.50
Machine shop turnings	6.50 to 7.00
Cast and mixed borings	5.25 to 5.75
No. 1 busheling	9.50 to 10.00
No. 2 busheling	7.25 to 7.75
No. 1 boilers, cut to sheets and rings	8.25 to 8.75
Boiler punchings	12.50 to 13.00
No. 1 cast scrap	11.75 to 12.25
Stove plate and light cast scrap	9.75 to 10.25
Railroad malleable	11.00 to 11.50
Agricultural malleable	10.00 to 10.50
Pipes and flues	8.50 to 9.00

Philadelphia

PHILADELPHIA, PA., March 28, 1911.

The general undertone of the market is strong. Transactions in pig iron have generally been small, and little forward business is moving, but prices are being fully maintained. The demand for finished materials appears to be well sustained, the mills in some cases showing a larger output than for many months. Few very large orders have been placed, although the number of smaller propositions has slightly increased. Structural material shows the most pronounced gain. The demand for billets drags, and forward business shows little indication of early favorable development. A slightly better demand for sheets is reported. Coke is dull. The old material market is inactive and prices in the leading grades again show a decline.

Iron Ore.—Sales are reported of several cargoes of Swedish ore, for early delivery, at 8½c. a unit, to furnaces in this district, with negotiations pending for larger quantities for extended shipment. Importations at this port during the week ending March 25 included one cargo each of Cuban, Swedish and Spanish ore, aggregating 14,318 tons, valued at $32,893.

Pig Iron.—Consumers and producers are both closely watching the market and await further developments before entering into negotiations for any large supplies for third quarter or more extended deliveries. The matter of prices is the important factor. Consumers would no doubt place business at the present range if sellers would accept such orders, but as the latter are now pretty well sold up for early delivery, at the present rate of production, they are, for the most part, disposed to hold out for a higher level for third quarter, but have not reached the point where they will openly quote for such delivery. The indecision regarding lake ore prices has, it is said, considerable to do with the present situation. Under prevailing circumstances, producers are pretty generally satisfied to dispose of their current make, which they have been largely able to do, as the volume of small lot business is good and deliveries are being fully taken by consumers. The bulk of the business has

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been in lots ranging from carloads for prompt shipment to a few hundred tons for delivery up to the end of the second quarter. Probably the largest proportion of such sales has been made at $15.75 to $16 for No. 2 X foundry iron, delivered in this vicinity. A few sellers, however, are still willing to do business at the old basis of $15.50. There is still considerable business under negotiation in low grade iron. One Delaware River pipe foundry has closed for several thousand tons for early delivery, the purchases being made in various sized lots, upward of 500 tons as a rule, from different sellers. The scarcity of the supply of low grade iron for early delivery in this district is becoming more apparent and the bulk of the large business pending is in Southern iron. A slightly better movement in Virginia foundry iron is reported, although little of the business is for delivery in this immediate vicinity. Prices are firm at $13, furnace, for either No. 2 X or No. 2 plain grades, for delivery over the next three months. The leading producer, however, still holds at an advance over that price for second quarter shipment. There has been some moderate buying of forge iron for rolling mill purposes. This grade is becoming scarce, as several producers have sold their near future supplies, while another will shortly blow out one of its furnaces for needed repairs. While $14.75 may still be done for this grade, sales have been made at $15 and in exceptional cases at $15.25, delivered. The movement in the steel making grades of iron is practically at a standstill. No inquiry for basic from consumers in this district is reported, and prices are nominally held at the level at which business was recently done. Transactions in low phosphorus iron have been confined to odd lot buying by the smaller consumers at recent quotations. For delivery in buyers' yards in the eastern Pennsylvania district, the following range of prices for standard brands, shipment during the second quarter, range as follows:

Eastern Pennsylvania, No. 2 X foundry	$15.50 to $16.00
Eastern Pennsylvania, No. 2 plain	15.25 to 15.50
Virginia, No. 2 X foundry	15.80 to 16.00
Virginia, No. 2 plain	15.80 to 16.00
Gray forge	14.75 to 15.25
Basic	15.25 to 15.50
Standard low phosphorus	21.50 to 22.00

Ferromanganese.—Notwithstanding the low price made recently for a large block for extended delivery, sellers in this district maintain quotations for moderate and small lots for second quarter and last half of the year shipment at $37.25 to $37.50, Baltimore. The demand from consumers in this vicinity, however, is still of an unimportant character.

Billets.—Eastern makers report a trifle better demand, although still mainly for small, prompt lots, and orders entered aggregate a somewhat better total. In forging billets a few moderate orders for delivery over the next three months have been placed. As there is no apparent scarcity in sight, consumers still show no interest in closing business for extended delivery. Prices are well maintained, open hearth rolling billets being quoted at $25.40, and ordinary forging billets, $30.40, delivered in this vicinity.

Plates.—Mills continue to receive a very fair amount of new business and specifications against contracts come out freely. March rollings have been heavier than for some months, and it is believed from the present outlook that they will continue to hold recent gains in the productive rate. Orders have not been confined to any particular class of material, but cover locomotive, bridge, tank, boiler and structural plates. Prices are being firmly maintained, 1.55c., minimum, being quoted for early deliveries in this territory.

Structural Material.—The volume of business placed and in prospect is more favorable. Several good propositions, including an addition, which had previously been considered, to the Bellevue-Stratford Hotel, requiring about 2700 tons. The Baltimore Bargain House is expected to be placed this week by the general contractor. Some little bridge work is pending, as are also a number of smaller buildings. While low prices are still reported for fabricated material, plain shapes are firmly held at 1.55c., minimum, delivered in buyers' yards in this territory.

Sheets.—Mills have taken on a better volume of business and are operating for the most part at full capacity. Orders are mostly confined to prompt lots, consumers not being inclined to anticipate their wants. Prices are unchanged, recent quotations being fully maintained by Eastern makers, who quote the following range for early shipments: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 and 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—The demand has been less active, although a fair inquiry for moderate lots is reported. The recent upward tendency of prices of iron bars appears to have been somewhat checked by the decreasing demand. The minimum price for refined iron bars is 1.30c., Eastern mill, although some makers still adhere to 1.35c., mill, the quotations being equal to a range of 1.37½c. to 1.45c., delivered in this vicinity. Steel bars are in moderate demand at unchanged prices, 1.55c., delivered, being named.

Coke.—The demand appears to be less urgent, consumers again largely confining themselves to prompt lot buying rather than placing extensive contracts. Negotiations are pending for at least one large block of furnace coke. Spot furnace coke is quoted at $1.65 per net ton, at oven, while for extended forward delivery quotations range from $1.90 to $2. Foundry coke, which has been moving quietly in small and moderate lots, is quoted at $2.20 to $2.40, at oven. For deliveries in this district the following prices, per net ton, are named:

Connellsville furnace coke	$3.80 to $4.15
Foundry coke	4.35 to 4.55
Mountain furnace coke	3.40 to 3.75
Foundry coke	3.95 to 4.15

Old Material.—A further weakness in prices of some grades is reported, due to the lack of interest shown by consumers and the fact that some small sellers have been compelled to move holdings. Consumers are now pretty well supplied and offering prices have in a number of instances receded. No. 1 heavy melting steel has been sold in small lots at $13.75, delivered, although mills have paid $14 for choice stock in lots upward of 1000 tons. A few hundred ton lots of turnings have been moved at lower prices. Railroad wrought has also sold at 50c. under recent quotations. The Alan Wood Iron & Steel Company was awarded the lot of 1800 tons of Panama scrap sold last week, the purchase price being $12.86 per ton, on cars, Port Richmond docks. The following range of prices is named for deliveries in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia ranging from 35c. to $1.35 per gross ton:

No. 1 heavy melting steel scrap	$13.75 to $14.00
Old steel rails, rerolling	15.00 to 15.50
Low phosphorus heavy melting steel scrap	18.00 to 18.50
Old steel axles	20.00 to 20.50
Old iron axles	26.00 to 27.00*
Old iron rails	18.50 to 19.00
Old car wheels	14.00 to 14.50
No. 1 railroad wrought	16.50 to 17.00
Wrought iron pipe	13.75 to 14.25
No. 1 forge fire	12.00 to 12.50
No. 2 light iron	8.00 to 8.50*
Wrought turnings	9.50 to 10.00
Cast borings	9.25 to 9.75
Machinery cast	14.00 to 14.50
Railroad malleable	12.50 to 13.00*
Grate bars	12.00 to 12.50
Stove plate	11.00 to 11.50

* Nominal.

Birmingham

BIRMINGHAM, ALA., March 27, 1911.

Pig Iron.—The demand has been comparatively light, with the majority of transactions involving prompt or nearby deliveries. Report is made of the sale of 6000 tons for shipment over the remainder of this year, but without specific information as to the price. The small lots that were sold for prompt shipment brought $11, Birmingham, for No. 2 foundry, except for the grades below No. 3, which carried premiums of 25c. to 50c. per ton. A very attractive tonnage of charcoal iron and special coke iron for the manufacture of car wheels was sold, as well as a round lot of basic iron. This last is understood to have brought a price equivalent to $11, Birmingham, and was for prompt shipment. The quotations that are being made on foundry grades for delivery during the last half name an advance of 50c. per ton over the $11 schedule, with $11.25 considered a compromise price for strictly third quarter deliveries. The tonnage that has been sold at those figures is very small. Within the week there has been a persistent rumor to the effect that a certain large interest would accept deliveries over the remainder of the year at $11. In view of the tonnage that was offered the producing interests at such figures as these just mentioned, and was not accepted, there is some disposition to discredit the rumor referred to; however, the preference for certain grades now being produced in this district gradually becomes more pronounced, and concessions from the asking price in some quarters of the market would not necessarily affect all quotations. The tonnage actually sold for delivery prior to July 1 is quite equal to expectations at the time quotations on forward deliveries were advanced, and the movement so far this month is even larger than had been anticipated. It is not believed that any additions will be made to the active producing capacity within at least 60 days.

Cast Iron Pipe.—The order book entries of local producers were not increased during the week by the addition of any large contracts, but the volume of small orders placed was quite satisfactory. Higher asking prices than those last quoted have been named for the small sizes of water pipe, and in view of the continued shortage in the produc-

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tion an advance in all quotations is not considered unwarranted. There has been no announcement of municipal lettings of importance other than has been mentioned in these columns. The requirement for the city of Los Angeles, Cal., is still being held in abeyance. We quote revised quotations on water pipe as follows, per net ton, f.o.b. cars here: 4 to 6 in., $23; 8 to 12 in., $22; over 12-in., average $21, with $1 per ton extra for gas pipe. These quotations are believed to correctly represent the market for small orders, but on large municipal contracts are probably subject to shading.

Old Material.—There is a stronger demand for old car wheels, and all wrought grades have been moving at a larger rate. A small lot of light cast and stove plate was recently sold at a slight concession, but with this exception no report has been made of any dealer's attempt to force a market at the expense of quotations. The reports from the consuming interests recently received indicate a fairly satisfactory rate of consumption, and the reduction of the tonnage in the hands of such concerns is being awaited with interest. The additions that are being made to dealers' stocks are of little consequence comparatively. We continue to quote asking prices as follows, per gross ton, f.o.b. cars here:

Old iron axles	$14.00 to $14.50
Old iron rails	12.50 to 13.00
Old steel axles	12.50 to 13.00
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	9.50 to 10.00
No. 1 country wrought	8.00 to 8.50
No. 2 country wrought	7.50 to 8.00
No. 1 machinery	10.00 to 10.50
No. 1 steel	9.50 to 10.00
Tram car wheels	9.00 to 9.50
Standard car wheels	10.50 to 11.00
Light cast and stove plate	8.00 to 8.50

Cincinnati

CINCINNATI, OHIO, March 29, 1911.—(*By Telegraph.*)

Pig Iron.—Inquiries and sales are lighter than for some time. Reports from St. Louis branches show there has been some buying of basic in that territory, but orders closed by local agencies are for carload to 100-ton lots. The inquiries from Michigan consumers for Southern foundry, previously mentioned, are still open, and there is a new one from that district for 500 tons of foundry iron, prompt shipment required, that will probably be placed with a Northern furnace. A nearby melter is asking for 300 tons of Southern No. 2 foundry, 100 tons of malleable and 100 tons of high manganese, all for second quarter delivery. Indiana continues to furnish a few requests for prices on small lots of foundry iron, principally for movement before July 1. In the face of a limited demand prices have not weakened and for spot shipment $11, Birmingham, and $14, Ironton, on No. 2 foundry, are strictly maintained. However, deliveries have been extended and at these figures third quarter contracts can be made, and in a few instances Southern No. 2 foundry has been bought at $11, with shipments running throughout the entire year. Malleable is listless and is quoted at $14 to $14.25, at furnace. It is reported that the melt of foundry iron is gradually increasing, and as yard stocks are not very heavy an improvement in the buying situation may develop sooner than is now anticipated. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows, for first quarter:

Southern coke, No. 1 foundry	$14.75
Southern coke, No. 2 foundry	14.25
Southern coke, No. 3 foundry	13.75
Southern coke, No. 4 foundry	13.50
Southern coke, No. 1 soft	14.75
Southern coke, No. 2 soft	14.25
Southern gray forge	13.00
Ohio silvery, 8 per cent. silicon	17.70
Lake Superior coke, No. 1	15.70
Lake Superior coke, No. 2	15.20
Lake Superior coke, No. 3	14.70
Standard Southern car wheel	25.25
Lake Superior car wheel	19.50

(*By Mail.*)

Coke.—A few foundry coke contracts have expired, and there are quite a number that will be completed next month, but there has been very little contracting, and foundry coke buying has been confined mostly to a limited number of cars to fill nearby requirements. Prices for foundry coke are the same in all three fields and range from $1.95 to $2 per net ton, at oven, for spot shipment, to $2.25 on contracts, and in some cases the last named figures are advanced for special brands. Furnace coke appears to be lagging a little, and while there has been no change in prices it is understood that a firm offer would shade quotable prices at least 5c. per ton. For domestic users a small lot of Pocahontas coke was bought at $1.75, at oven, with shipment extended through the first half. For prompt shipment in the Pocahontas, Wise County and Connellsville districts, furnace coke is obtainable around $1.55 to $1.65 per net ton, at oven, with the usual advances on contracts.

Finished Material.—Last week was reported as being reasonably good, but the present one opens with a smaller number of inquiries, and mill agencies generally anticipate a rather dull period until after the Supreme Court decisions are rendered in the trust cases. In direct opposition to this theory is the fact that structural material is being contracted for more freely than is any other line of finished material—an indication that building operations are not on the wane. Mill prices remain at 1.40c., Pittsburgh basis, and local warehouse quotations are from 1.85c. to 1.95c.

Old Material.—Business is very quiet, and no change is looked for by local dealers for several weeks. Sellers of scrap have acquired the same indifference that buyers have lately been exhibiting, and the tonnage being moved is very light. Prices for delivery in buyers' yards, southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton	$12.00 to $12.50
Cast borings, net ton	5.00 to 5.50
Steel turnings, net ton	6.00 to 6.50
No. 1 cast scrap, net ton	11.00 to 11.50
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	17.00 to 17.50
Bundled sheet scrap, gross ton	8.50 to 9.00
Old iron rails, gross ton	14.50 to 15.50
Relaying rails, 50 lb. and up, gross ton	21.50 to 22.50
Old car wheels, gross ton	12.00 to 12.50
Heavy melting steel scrap, gross ton	11.00 to 11.50

The Globe Iron Company, manufacturer of high silicon softeners, Jackson, Ohio, has given the Domhoff & Joyce Company, with offices in Cincinnati, Chicago, Cleveland, Indianapolis and St. Louis, the exclusive sales agency for Globe pig iron in the Western territory outside of Cleveland, Ohio.

St. Louis

ST. LOUIS, March 27, 1911.

Transactions in pig iron have included no large tonnages, but merchant sellers report a continued demand from small consumers. Business in coke has been of considerable volume. The leading car works is increasing its force of employees, and railroad buying of track material is better. The demand for finished iron and steel is improving, and the call for finished metals is normal for the season. Scrap iron and steel continue dull.

Pig Iron.—While the leading sales agencies report the past week quite dull, merchant sellers state that business with small consumers has been keeping up well, and one house claims that March will prove to be the best month in the past six. The representative of a leading Southern producer states that his business for the present month is proving satisfactory. Among the inquiries noted are 500 to 1000 tons of low phosphorus iron for shipment over the last half; 200 tons of Lake Superior charcoal for prompt deilvery; 1000 tons of No. 2 Southern analysis iron, for shipment over the last half. Among the sales reported are 300 tons of ferromanganese, for shipment over the last half, and about 600 tons of Southern No. 2 foundry to various parties for prompt and deferred delivery. In so far as it is claimed that No. 2 Southern foundry cannot be bought at less than $11, Birmingham, even for cash and spot shipment, the market is stronger, but it has changed front from a seller's to a buyer's market, owing to a slacking up in the demand from large consumers. While some agencies are holding No. 2 Southern at $11.50, Birmingham, for shipment over the last half, it is reported that it can be bought for that delivery at $11. With large intending purchasers, no other delivery is of interest, as they are pretty well stocked or covered for their wants to July 1. We quote No. 2 Northern foundry at $14, Ironton, Ohio, for shipment prior to July 1, and $14.50 for last half.

Coke.—There was pretty free buying of coke reported for the week. Among the sales mentioned are 4000 tons of Connellsville foundry for shipment over the remainder of the year; 5000 tons of Stonega foundry for shipment over the last half; 4500 tons of furnace coke for prompt shipment. An inquiry for 10 cars of Connellsville foundry for immediate shipment is mentioned.

Finished Iron and Steel.—Some inquiry is reported for light rails from coal mines. Structural material is in improved demand. Business in steel bars is moderate, owing to lower prices for iron. There is more doing in track material, and the sale of 24,000 tie plates to the Terminal Railroad is mentioned.

Old Material.—The market for scrap iron and steel shows no improvement. Owing to dealers carrying pretty large stocks very little is doing even in that direction, and con-

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sumers will not purchase except at considerable concessions. For light sections of relaying rails, there is a demand from lumber interests. There is considerable inquiry for scrap iron and steel, but it is believed that it is mainly for inventory purposes. There were no railroad offerings the past week. We continue our quotations, but the market is easier. We quote dealers' prices, per gross ton, f.o.b. St. Louis:

Old iron rails	$13.50 to $14.00
Old steel rails, rerolling	13.00 to 13.50
Old steel rails, less than 3 ft	12.00 to 12.50
Relaying rails, standard sections, subject to inspection	23.50 to 24.00
Old car wheels	12.50 to 13.00
Heavy melting steel scrap	11.50 to 12.00
Frogs, switches and guards, cut apart	11.00 to 11.50

The following quotations are per net ton:

Iron fish plates	$11.00 to $11.50
Iron car axles	18.00 to 18.50
Steel car axles	17.50 to 18.00
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	10.50 to 11.00
Railway springs	10.00 to 10.50
Locomotive tires, smooth	16.00 to 16.50
No. 1 dealers' forge	9.00 to 9.50
Mixed borings	4.50 to 5.00
No. 1 busheling	9.50 to 10.00
No. 1 boilers, cut to sheets and rings	8.00 to 8.50
No. 1 cast scrap	11.50 to 12.00
Stove plate and light cast scrap	8.50 to 9.00
Railroad malleable	9.00 to 9.50
Agricultural malleable	8.50 to 9.00
Pipes and flues	8.00 to 8.50
Railroad sheet and tank scrap	8.00 to 8.50
Railroad grate bars	8.50 to 9.00
Machine shop turnings	7.00 to 7.50

F. C. Pullen, who for several years has been superintendent of the business department of the Evansville Gas & Electric Light Company, has become connected with the St. Louis office of the Domhoff-Joyce Company, as salesman for pig iron and coal.

The Corrugated Bar Company, St. Louis, has increased its capital stock from $500,000 to $600,000.

The contract for the new Young Women's Christian Association Building has been awarded to the Selden-Brick Construction Company. It is to be a five-story structure and will cost $250,000.

Buffalo

BUFFALO, March 28, 1911.

Pig Iron.—Orders aggregating about 10,000 tons of foundry and malleable grades for New England and New York State points are reported placed, principally for first half delivery, and some orders for basic, chiefly of small tonnage, have been taken. New inquiry is confined almost entirely to last half delivery, and furnaces are still reluctant to bid on extended forward deliveries. Shipments on contracts have been heavy. Some furnaces are seeking current delivery business a little more aggressively, and the rigid adherence to the advanced schedule of prices quoted recently seems to have relaxed to some extent, with a consequent easing off equivalent to about 25c. per ton on most grades. Other furnaces report that what business is being taken is at the recently established higher schedule level. Some off grade malleable has been sold at $14, but the regular grade is held at $14.25 to $14.50, some furnaces asking $15. We quote as follows, f.o.b. Buffalo, for first half:

No. 1 X foundry	$14.50 to $15.00
No. 2 X foundry	14.25 to 14.75
No. 2 plain	14.00 to 14.50
No. 3 foundry	13.75 to 14.25
Gray forge	13.50 to 14.00
Malleable	14.25 to 15.00
Basic	14.50 to 15.00
Charcoal	17.00 to 17.50

Finished Iron and Steel.—Current orders in steel bars, small shapes, plates and plain structural material are coming forward in fairly good volume, both as regards number and tonnage, and specifications on existing contracts keep up well. Some business is being done in plates and in squares for axles with automobile manufacturers; also in cold rolled steel with the same trade. Considerable new work for traction and steam lines in Canada is being estimated on, in addition to that mentioned last week. Fresh inquiries are coming out for fabricated structural material and the outlook is good for a large amount of spring and summer work in this line. Figures will soon be taken for a loft and light manufacturing building for the Niagara Garment Company, Buffalo, requiring about 200 tons; for the steel superstructure for the new water works tunnel intake, Buffalo, 100 tons, and for the International Hotel convention hall and theater and the remodeling of the Cataract House, Niagara Falls, requiring several hundred tons. Bids will also be received the first week in April for steel for a six-story warehouse for the Syracuse Chilled Plow Company, Syracuse. The Buffalo Structural Steel Company has received contract for the steel, 125 tons, for the addition to the Brunner Baking Company's plant, Buffalo. The Lackawanna Bridge Company will fabricate and erect the steel for the Niagara Radiator & Boiler Company's plant addition at North Tonawanda, 100 tons; also the steel for power house and wheel pit addition for the Niagara Falls Power Company, Niagara Falls. The Wurtz & Son Iron Works, Buffalo, has the contract for the steel for the addition to the Buffalo Bolt Company's plant, North Tonawanda, N. Y., 100 tons, and the Syracuse Bridge Company for the steel work for the church of St. Anthony de Padua, Syracuse.

Old Material.—There has been a general weakening in the price of scrap, amounting to 50c. to 75c. per ton in practically all lines, due largely to the fact that current contracts are nearing completion and mills are suspending shipments temporarily. New buying is very limited, consumers purchasing only for current needs. We therefore revise prices as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$13.00 to $13.25
Low phosphorus steel	17.25 to 17.50
No. 1 railroad wrought	15.50 to 15.75
No. 1 railroad and machinery cast scrap	14.50 to 14.75
Old steel axles	19.00 to 19.50
Old iron axles	23.00 to 24.00
Old car wheels	14.50 to 14.75
Railroad malleable	13.75 to 14.00
Boiler plate	11.50 to 11.75
Locomotive grate bars	11.75 to 12.25
Pipe	10.00 to 10.25
Wrought iron and soft steel turnings	7.25 to 7.75
Clean cast borings	6.75 to 7.00

The Buffalo Bolt Company, North Tonawanda, N. Y., has let contract for a new building, 50 x 250 ft., to be added to its plant. This building will be equipped with the latest machinery for wire drawing. Contracts are also soon to be let for other new buildings.

Cleveland

CLEVELAND, OHIO, March 28, 1911.

Iron Ore.—A few more reservations of 1911 ore have been made, the seller declining to name prices, which will be at the market that will be established later. It is doubtful if anything will be done regarding prices for several weeks, or until consumers appear ready to place contracts for a fair tonnage. We quote prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—Fewer inquiries are coming out than in the previous few weeks, and sales of only a small tonnage are reported. Shipments are slightly better, but the general foundry situation shows little change, and few consumers of foundry iron are taking any interest in the matter of covering for the last half. The largest sale reported is 1000 tons of foundry iron for the second and third quarter. A consumer in northern Ohio is in the market for 1000 tons of No. 2 foundry for second quarter delivery. Local furnaces are holding firmly to $14 for No. 2 foundry for the second quarter and $14.50 for the last half. Valley furnaces quote No. 2 foundry at $13.75 to $14 for the second quarter, and $14.25 to $14.50 for the last half. The $14.25 quotation, however, appears to be becoming more general. For prompt shipment and the second quarter we quote, delivered, Cleveland, as follows:

Bessemer	$15.90
Northern foundry, No. 1	14.50
Northern foundry, No. 2	14.25
Northern foundry, No. 3	14.00
Gray forge	13.50
Southern foundry, No. 2	15.35
Jackson Co. silvery, 8 per cent. silicon	18.00

Coke.—There is no inquiry for furnace grades. A few contracts for foundry coke for the last half have been closed, but consumers generally do not appear ready to cover for their last half requirements. We quote standard Connellsville furnace coke at $1.60 to $1.65 per net ton, at oven, for prompt shipment, and $1.75 to $2 for the last half. Connellsville 72-hour foundry coke is held at $2 to $2.15 for spot shipment and $2.25 to $2.50 for the remainder of the year.

Finished Iron and Steel.—Mill agencies continue to get a good volume of small current orders and specifications on contracts. The ore handling plant to be erected by the Wellman-Seaver-Morgan Company for the Pennsylvania Railroad in Cleveland will require 2500 to 2700 tons of structural shapes, orders for which will be placed by the builder in lots as required. The Forest City Steel & Iron Company, Cleveland, has taken the contract for the technical high school in Cleveland, requiring 330 tons. The Pere Marquette Railroad has let contracts for bridges aggregating 1200 tons. Of this, 700 tons went to the American Bridge

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Company, the remainder being divided between the King Bridge Company, the Lackawanna Bridge Company and the Wisconsin Bridge Company. The county commissioners of Cuyahoga County, Cleveland, will receive bids April 29 for the Dunham road grade elimination of the Pennsylvania & Wheeling and Lake Erie railroads, near Cleveland, requiring 400 tons. The city of Cleveland has decided to repair the Central viaduct in Cleveland and will receive bids for this work, requiring 400 tons, late in the summer. In addition to similar work already pending, considerable grade crossing elimination work is in prospect in Cleveland. Some of the mill agencies are taking steel bar contracts for the entire last half at current prices. Others are limiting these contracts to the third quarter and have opened their books for structural and plate contracts for the same delivery. Steel bars, plates and structural material are firm at 1.40c., Pittsburgh. The demand for sheets continues moderate and prices are being firmly maintained. The demand for light rails in carload lots has become quite active. Somewhat better inquiry is coming out for forging billets. The demand for iron bars is not active. Prices are firm, the minimum quotation being 1.30c., Cleveland.

Old Material.—The market is very quiet, and the absence of activity has resulted in a further weakening of prices. The Upson Nut Company, Cleveland, which is a new buyer of scrap, has purchased 1500 tons of heavy melting steel at about $13, delivered, and is in the market for 2000 to 3000 tons more, for which it is offering the same price. Some of the local consumers are holding back on shipments, being well filled up. Yard dealers are buying very little for stock at present. We have reduced quotations 25c. to 50c. a ton on borings, turnings and busheling. Prices on some other grades are largely nominal, and inquiries would probably bring out prices slightly lower than quotations. Dealers' prices, per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.00 to $14.50
Old iron rails	17.00 to 17.50
Steel car axles	19.50 to 20.00
Heavy melting steel	12.75 to 13.00
Old car wheels	13.00 to 13.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	12.00 to 12.50
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	8.00 to 8.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	6.50 to 7.00
Iron and steel turnings and drillings	7.25 to 7.75
Steel axle turnings	9.00 to 9.25
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	13.00 to 13.25
No. 1 cast	11.75 to 12.00
Stove plate	11.00 to 11.25
Bundled tin scrap	11.00 to 11.50

Metal Market

NEW YORK, March 29, 1911.

THE WEEK'S PRICES

Cents Per Pound for Early Delivery.

	Copper, New York.			Lead.		Spelter.	
March.	Lake.	Electrolytic.	Tin, New York.	New York.	St. Louis.	New York.	St. Louis.
23	12.50	12.25	40.10	4.45	4.30	5.60	5.45
24	12.50	12.25	40.50 to 40.75	4.45	4.30	5.60	5.45
25	12.50	12.25	....	4.45	4.30	5.60	5.45
27	12.50	12.25	41.20	4.45	4.30	5.60	5.45
28	12.50	12.25	41.25	4.45	4.30	5.60	5.45
29	12.50	12.25	41.25	4.45	4.30	5.60	5.45

For the first time in several weeks the price of spot tin is close to the importation cost. Good sales of copper have been made but prices are unsteady. Lead has advanced sharply on the strength of a good buying movement. Buyers are neglecting spelter, and reports of price cutting are current.

Copper.—While good sales of copper have been made to consumers in need of stocks, the general attitude of buyers seems to indicate that they are waiting for lower prices. It is believed that if sellers would reduce their quotations to 12.12½c. for electrolytic there would be heavy buying, as intimation has been given to that effect by a number of large consumers. Manufacturers of copper wire have come into the market with inquiries for good round lots and some of them have been obliged to place orders at the prevailing quotation. Street railway developments in New Jersey and Pennsylvania are bringing out a good call for copper, and the promised buying movement seems to be only delayed by a test of endurance between the sellers and buyers. The forthcoming report of the Copper Producers' Association, covering the March statistics, is not much of a factor in the present situation, as all concerned admit that consumption during the month has not been large while the March exports to date have only amounted to 17,996 tons, with but two days' shipments to be heard from. Lake copper is freely offered at 12.50c. and electrolytic at 12.25c. for spot delivery. During the week the price of lake has been shaded in the case of a few sales of outside lots. The London market to-day closed steady with spot quoted at £54 11s. 3d. and futures £55 2s. 6d. The sales were 200 tons of spot and 150 tons of futures.

Pig Tin.—The pig tin market is in a more satisfactory condition, from the consumers' standpoint, than it has been in several months. For the first time in many weeks spot tin could be bought within a few points of the cost of importation, and on Friday and Monday the sales were made at prices corresponding to the London quotation. The situation was relieved greatly on Monday when the steamer Minneapolis arrived with 715 tons, as arrangements were made to discharge the cargo in unusually quick time, with the result that the tin thus received was available for delivery yesterday, and the entire cargo will be included in the March deliveries. It is known that the March deliveries of tin were exceedingly heavy and perhaps record-breaking, being about 4500 tons. The stock on hand March 1 was 1227 tons, and this added to the arrivals of 5535 tons makes the total available tin for the month 6762 tons. The dealers did not do much business during the week, as most of the tin delivered had been contracted for weeks ago. There was some good trading on Friday when about 250 tons changed hands, and the sales were mostly to consumers. Tin is still offered at above 40c., but the consumption is also so unusually good that the price does not seem to be greatly inflated. In London to-day the market closed steady, with spot quoted at £187 15s. and futures £186 10s. Sales of spot were 100 tons and futures 550 tons. Tin sold this afternoon at 41.25c. in New York.

Tin Plates.—The mills are busy on can makers' specifications, but the demand from other sources is not very large. The railroads were expected to be good customers for tin plates at this time, but no demand has developed from that source. Quotations on 100-lb. coke plates continue at $3.94.

Lead.—Outside sellers of lead are doing a good business, and the buying movement extends all over the East. Consumers came into the market on Thursday, and the price was run up to 4.45c., New York. Even that price was considered attractive, as an excellent business was done both here and in St. Louis. Contractors who use a great deal of lead in conduit work have been taking large quantities of lead and sellers are steadily stiffening their terms. The leading interest continues to keep its price firm at 4.50c., New York, although its quotations are relatively closer to outside sellers' prices in other markets. It is believed by many that the general market will shortly advance to the figure asked by the American Smelting & Refining Company. To-day lead could be had in St. Louis for 4.30c. and in New York, 4.45c.

Spelter.—The spelter market is ragged, and, while many leading sellers continue to demand 5.65c., New York, it is certain that this price is being cut from three to five points in order to induce sales. Buyers are indifferent, and knowing that concessions are being made they are shopping about a great deal before placing orders for what little they need. The St. Louis market is very uncertain, and while 5.45c. is generally quoted there, some large sellers are offering inducements under that price.

Antimony.—The market is dull. Consumers are taking no interest in the situation and are placing only small orders. Cookson's is nominal at 9.50c.; Hallett's, 9.12½c.; Hungarian and Chinese grades, 8.00c. Hallett's and Hungarian grades can be bought at 5 to 15 points under the above quotations for delivery during June and July.

Old Metals.—The market is dull but steady. Selling quotations are as follows:

	Cents.
Copper, heavy cut and crucible	11.75 to 12.00
Copper, heavy and wire	11.50 to 11.75
Copper, light and bottoms	10.75 to 11.00
Brass, heavy	8.00 to 8.25
Brass, light	6.75 to 7.00
Heavy machine composition	10.50 to 10.75
Clean brass turnings	7.75 to 8.00
Composition turnings	8.75 to 9.00
Lead, heavy	4.20 to 4.25
Lead, tea	3.95 to 4.00
Zinc scrap	4.25 to 4.30

Metals, Chicago, March 28.—Prices for metals are without change this week. These prices are being maintained at the expense of any brisk trading. We quote Chicago prices as follows: Casting copper, 12⅝c.; lake, 12¾c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 41½c.; small lots, 43½c.; lead, desilverized, 4.45c. to 4.50c., for 50-ton lots; corroding, 4.70c. to 4.75c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.50c. to 5.55c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c., in small lots; sheet zinc is $7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper

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wire, crucible shapes, 12¼c.; copper bottoms, 10¼c.; copper clips, 12c.; red brass, 10½c.; yellow brass, 9c.; lead pipe, 4⅝c.; zinc, 4¼c.; pewter, No. 1, 29c.; tin foil, 32c.; block tin pipe, 35c.

Metals, St. Louis, March 27.—Lead is strong at 4.30c. to 4.32½c.; spelter quiet at 5.40c., both at East St. Louis. Zinc ore is quiet, quoted at $37 to $40 per ton, Joplin base. Tin is stronger, at 40.85c.; antimony (Cookson's) unchanged at 9.85c.; lake copper, 12.85c.; electrolytic, 12.60c., all at St. Louis. The demand for finished metals is normal for the season.

New York

NEW YORK, March 29, 1911.

Pig Iron.—Conditions have changed little in the past week, either as to prices or volume of business. The foundry industry is feeling its way along, and the average melter of iron, having a supply contracted for that will last well into the second quarter and in some cases into midsummer, is not interested in deliveries in the latter part of the year. While the volume of inquiry is not large, a number of transactions have been put through on the initiative of furnace companies, and what is done in this way does not get much publicity. The furnaces seem to be maintaining their attitude as to prices for the third and fourth quarter, and are not accepting the offers commonly made which are on the basis of early delivery prices. Some business has been done with New York State foundries, largely by furnaces in the Buffalo district. On Eastern business from Buffalo the canal rate is now a factor, where deliveries are to begin in April. Whereas one year ago furnaces were quoting an Eastern delivery price and assuming responsibility for fluctuations in canal freights, they are now quoting f.o.b. boat at Buffalo, so that the buyer assumes the risks of the freight market. Last year's freights were as a rule higher than the basis used by the furnaces in early season sales. A large inquiry for foundry iron has come from the American Locomotive Company, and a Connecticut valve company is in the market for 1000 tons. Buying by New Jersey foundries has been light. Local sellers have received the inquiry of the Dominion Iron & Steel Company, Sydney, Nova Scotia, for 6000 tons of basic iron. The negotiations involve some arrangement for shipment by vessels bringing Newfoundland ore to the Delaware River. A moderate lot of basic from an eastern Pennsylvania furnace has been taken by a New Jersey steel foundry. We quote tidewater deliveries as follows: Northern No. 1 foundry, $15.75 to $16; No. 2 X, $15.50 to $15.75; No. 2 plain, $15.25 to $15.50; Southern No. 1 foundry, $15.50 to $16; No. 2, $15.25 to $15.50.

Finished Iron and Steel.—March will close about on a par with February, and no marked increase in activity is in sight. However, present conditions are fairly satisfactory and are expected to continue. Plates and bars, both iron and steel, are not in very good demand, but orders are being received in sufficient volume to keep the mills at about three-quarters capacity, and all prices are firm. The week has seen fewer structural contracts closed than its two predecessors, but some good tonnages were taken and more are developing. The Quebec Bridge has come to the fore again, and it is now reported that the St. Lawrence Bridge Company, organized with a view to building this bridge, has had its design approved and will fabricate the structure and that the Carnegie Steel Company will supply the 60,000 tons of material required. The American Building Company's project is taking more definite shape, and if it goes through the George A. Fuller Company will doubtless have the contract and the American Bridge Company the steel. The purpose is to build 10 unit warehouses with light manufacturing facilities, in Boston, somewhat similar to those at the Bush Terminal in Brooklyn, and if these are successful more will be built. It is uncertain what tonnage will be involved in the initial 10 buildings, but possibly as high as 15,000 tons. No award has been made on the Trinity Corporation's printing building, which will take 2800 tons, nor on the 1500 tons of bridge material for the Western division of the Grand Trunk Railway. The Lehigh & New England's bridge at Bethlehem, Pa., 1600 tons, has been given to the American Bridge Company. The Boston & Albany is inquiring for several small bridges aggregating about 1000 tons; the Buffalo, Rochester & Pittsburgh, two bridges near Rochester, requiring together about 500 tons; the Boston & Maine, a truss span near Bellows Falls, Vt., of 300 tons, and the Pennsylvania, a bridge over Oil Creek, of 400 tons. The steel for the Epstein Building, or Baltimore Bargain Store, 2400 tons, has been awarded by the general contractor, the Noel Construction Company, to Dietrich Brothers. The McClintic-Marshall Construction Company has the 700 tons for the grand stand at the Fair Grounds in Allentown, Pa., through the Ochs Construction Company, general contractor, and the Leh building in the same city, requiring about the same tonnage of steel, has been awarded the Guerber Engineering Company. Bids are in and the contract is expected to be closed this week for the 1000 tons for the Jarmulowski bank building at Canal and Orchard streets, New York City. Prices remain unchanged: Plain structural material, plates and steel bars, 1.56c. to 1.61c., and bar iron 1.40c. to 1.45c., all New York. Store prices for plain material and plates, New York, are 1.85c. to 1.95c.

Ferroalloys.—Although good sales of ferromanganese have been made, the market is weak. It is estimated that 8000 tons has been sold so far in March, and there are some fair inquiries to be heard from. Ferromanganese is freely offered at $36.50 to $37, Baltimore. Ferrosilicon is quiet. European 50 per cent. cannot be imported for less than $57, New York and Baltimore. European ferrosilicon now in this country can be had at $55, Pittsburgh, and the domestic product is offered at the same price.

Cast Iron Pipe.—The Charles Millar & Son Company, Utica, N. Y., was the successful bidder for the 3800 tons of water pipe on which proposals were opened March 27 by the city of Pittsfield, Mass. Bids are being received by the Board of Contract and Supply, Syracuse, N. Y., for 600 tons of water pipe. Rather more activity is reported in purchases by private companies, but no important public lettings are announced. Prices continue at about the level recently prevailing, carload lots of 6-in. being available at $21 to $22 per net ton, tidewater.

Steel Rails.—The Lehigh & New England has placed 4000 tons with the Bethlehem Steel Company, and the George's Creek & Cumberland has given an order for 6550 tons to the same company. The Western Maryland, which bought some of its 1911 rails in Pittsburgh, has bought 4000 tons from the Maryland Steel Company. Pittsburgh reports but a few hundred tons of rails closed in the past week, while in the Chicago district new orders amounted to about 1700 tons.

Old Material.—Dullness prevails in all branches of the old material market. Sales of heavy melting steel scrap appear to be confined to small quantities and even these transactions are few. Consumers of wrought scrap seem to be completely uninterested. A little movement is observed in heavy cast scrap and other ordinary foundry stock. Old car wheels are in no demand whatever; offers of small lots have been made in various directions without eliciting any bids. Prices are weak, and the tendency appears to be decidedly downward. Dealers' quotations are as follows, per gross ton, New York and vicinity:

Rerolling rails	$12.00 to $12.50
Old girder and T rails for melting	11.00 to 11.50
Heavy melting steel scrap	11.00 to 11.50
Relaying rails	20.00 to 21.00
Standard hammered iron car axles	22.50 to 23.00
Old steel car axles	16.50 to 17.00
No. 1 railroad wrought	13.50 to 14.00
Wrought iron track scrap	13.00 to 13.50
No. 1 yard wrought, long	12.50 to 13.00
No. 1 yard wrought, short	11.50 to 12.00
Light iron	5.00 to 5.50
Cast borings	6.50 to 7.00
Wrought turnings	7.00 to 7.50
Wrought pipe	11.00 to 11.50
Old car wheels	12.00 to 12.50
No. 1 heavy cast, broken up	12.00 to 12.50
Stove plate	9.00 to 9.50
Locomotive grate bars	9.50 to 10.00
Malleable cast	11.00 to 11.50

Notes on Prices

Rope.—Business with manufacturers is not showing the improvement that was expected to be in evidence by this time, as spring demand is still an expectation. When Manila rope is ordered, the best quality has the largest call. The following quotations represent prices to the retail trade in the Eastern market for rope 7-16 in. in diameter and larger, with card advances for smaller sizes: Pure Manila of the highest grade, 8½c. to 9c. per pound; second grade Manila, 7½c. to 8c. per pound; hardware grade 7c. to 7½c. per pound; pure sisal of the highest grade, 6½c. per pound; second grade, 6c. per pound; rove jute rope, ¼-in. and up, No. 1, 6½c. to 7c. per pound; No. 2, 6c. to 6¼c. per pound.

White Lead in Oil.—During the past month there has been a moderate demand for white lead in oil, which is probably all that could be expected, in view of the high prices ruling for linseed oil and turpentine. For the best brands New York quotations are as follows: Lots of 500 lb. and over, 7¼c. in 100, 250 and 500 lb. kegs; 7½c. in 25 and 50 lb. kegs. In lots of less than 500 lb. the usual advance of ½c. is charged.

Linseed Oil.—Last week the Eastern and foreign markets were weak, resulting from light demand and the lower price of seed. Some of the Northwestern crushers fear their limited stocks of oil will not be sufficient to fill

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orders this summer. This view of the situation is taken regardless of the number of linseed oil substitutes on the market on account of the high price of linseed oil. Lower card prices have been announced as follows, New York, in 5-barrel lots or more:

	Cents.
State, raw	91
City, raw	91

Oil in lots of less than 5 bbl., 1 cent advance per gallon.
Boiled oil, 1 cent advance per gallon over raw.

Naval Stores.—There has been another sharp advance in turpentine, the price now overtopping that of linseed oil. It is said that this is the first time since the Civil War that the price of turpentine has gone beyond a dollar per gallon. How long the unusually high price will continue is difficult to predict, but advices from the centers where turpentine is produced are to the effect that indications point to a larger crop than last season. Demand at this point is for actual requirements only. New York turpentine quotations in 5-barrel lots are as follows:

In oil barrels	$1.10½
In machine barrels	1.11

Less than 5-bbl. lots, ½ cent advance per gallon.

Rosins are in limited demand and prices are firm. On the basis of 280 lb. to the barrel, common to good strained is quoted at $8.25 and grade D at $8.55 in the New York market.

The Forter-Miller Electric Company, engineer and contractor, will remove its offices April 1 from Rooms 801-802 to rooms 1001-1003 Hartje Building, Pittsburgh, Pa.

No. 2 furnace of the Warwick Iron & Steel Company, Pottstown, Pa., will be blown out at the close of the week. Extensive repairs are needed, which may require several months.

The Morse Chain Company, Ithaca, N. Y., has opened a branch sales office in Cleveland at 421 Engineers Building, with H. C. Minier in charge as sales manager.

The Continental Bridge Company, Peotone, Ill., secured the contract for the coal handling crane for the Albert Lea Light & Power Company, Albert Lea, Minn.

The Pennsylvania Steel Company is blowing in another furnace at its Steelton, Pa., group.

Iron and Industrial Stocks

NEW YORK, March 29, 1911.

The stock market has simply been drifting for some time, awaiting trade or political developments. Transactions have been exceedingly light, some stocks having been completely neglected. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., pref.	31⅛-32½	Pressed St., pref.	97¾-98
Beth. Steel, com.	32⅛-32½	Railway Spr., com.	33½-34
Beth. Steel, pref.	61⅛-63⅜	Railway Spr., pref.	98
Can, com.	9½	Republic, com.	33¾
Can, pref.	80⅝-81¼	Republic, pref.	97½-97¾
Car & Fdry, com.	53½-54	Sloss, com.	53
Car & Fdry, pref.	116½	Pipe, com.	17⅜
Steel Foundries	47½-48	Pipe, pref.	58-58¾
Colorado Fuel	32¾-32¾	U. S. Steel, com.	78¼-79½
General Electric	148½	U. S. Steel, pref.	118½-119¾
Gr. N. ore cert.	61⅛-63¼	Westinghouse Elec.	66½-67
Int. Harv., com.	116½-117⅛	Va. I., C. & C.	60
Int. Harv., pref.	124	Am. Ship, com.	73-75
Int. Pump, com.	40⅞-41¼	Chi. Pneu. Tool	50¾-53
Int. Pump, pref.	89	Cambria Steel	47⅝-48⅛
Locomotive, com.	38⅛	Lake Sup. Corp.	29¾-30
Locomotive, pref.	106½-107	Pa. Steel, pref.	107½
Nat. En. & St., com.	17½-18½	Warwick	10¾
Pitts. St., pref.	101½-102	Crucible St., com.	13-13¼
Pressed St., com.	33-33½	Crucible St., pref.	79¾-80¼
		Harb.-W. Ref., pref.	95¾-96

Final approval has been given the proposed reorganization of the finances of the Westinghouse Machine Company, Pittsburgh, by the creditors' committee, which has worked out the details of the proposition. A plan has been adopted to place a $10,000,000 first and refunding mortgage on the properties of the Westinghouse Machine Company and the Westinghouse Foundries Company, which will secure the outstanding indebtedness, furnish a security that can be marketed and provide ample working capital. A Finance Committee has been named, consisting of E. M. Brackenridge, W. H. Rea and T. L. Brown, which will assist President George Westinghouse and the Board of Directors.

The Crucible Steel Company of America, Oliver Building, Pittsburgh, Pa., reports profits for February at $318,880.60. The profits for the six months ended February were $1,995,079.40. Deducting charges and appropriations for depreciation, repairs and contingencies, amounting to $671,928.22, leaves the net profits for the six months at $1,323,151.18.

Dividends.—The Westinghouse Electric & Mfg. Company has declared a quarterly dividend of 1¾ per cent., and in addition thereto 1¾ per cent. on account of dividends accumulated since September 30, which will be paid April 15 on the preferred stock of the company.

The Chicago Pneumatic Tool Company has declared the regular quarterly dividend of 1 per cent. on the capital stock, payable April 25.

The Des Moines Rapids Hydroelectric Plant

The Keokuk & Hamilton Motor Power Company, Keokuk, Iowa, has under construction a dam for the development of the power of the Des Moines rapids of the Mississippi River at Keokuk, Iowa, and Hamilton, Ill. The dam will be built across the river at the foot of the rapids, and a power house immediately below the dam and parallel with the stream. Including abutments, it will be 4700 ft. long, or seven-eighths of a mile. It will be built of concrete, without reinforcement of any kind, will be locked firmly into the rock bed of the river and will be practically a monolith. The power house will be 1400 ft. long and 123 ft. wide. There will be 38 generating units, each consisting of a vertical shaft, on the lower part of which will be two turbines, or water wheels; on the upper part will be the revolving parts of the generators. The weight of all these moving parts will be carried on a suitable truss bearing located in a chamber just below the generator. Each unit will have its own speed governor and auxiliary apparatus.

The construction of the dam will destroy the Des Moines rapids canal, with its three locks, in place of which there will be built a large lock on the site of the present lower lock, which will be both wider and longer than the present structure, and a lake of deep water over a mile wide and 40 miles long will be substituted in place of the present canal. In connection with the lock there will be built a large floating drydock for the construction and repair of floating crafts. There will be required in this work approximately 500,000 cu. yd. of masonry, 500,000 barrels of cement and 7000 tons of steel. The operating head will vary from 39 to 21 ft., developing 200,000 hp. The first long distance transmission line will be run to St. Louis, and later other transmission lines will be developed running from Keokuk and Hamilton. It is expected that the initial installation of 120,000 hp. will be completed in two and one-half years.

Judicial Decisions of Interest to Manufacturers

ABSTRACTED BY A. L. H. STREET.

Defective Condition of Appliances.—As affecting liability for injury to a workman, the unexplained fact that a hook broke while suspending a weight much less than a sound hook of the same character should hold is evidence that the hook was defective.—Massachusetts Supreme Judicial Court, Sullivan *vs.* Reed Foundry Company, 93 Northeastern Reporter 576.

Risks Assumed by Employee.—An employee assumes not only the ordinary risks incident to the employment but, as well, all risks arising and becoming known to him during his service. Yet the employer by promising to repair a defect complained of as an inducement to the employee to continue, takes from the workman the risk, and, thereafter, until the time fixed for the repair, assumes it, unless the danger from it is so great or so imminent that a person of ordinary prudence would not continue in the employment after discovering the condition. Where the promise to repair is general and indefinite the employer's undertaking runs for a reasonable time.—New Jersey Supreme Court, Pavan *vs.* Worthen & Aldrich Company, 78 Atlantic Reporter 658.

Buyer's Right on Breach of Warranty.—On breach of warranty as to the quality of articles sold, the buyer can retain them and recover his damages by counterclaim in

a suit by the seller to recover the price. As a general rule, as to articles having a market value, the measure of the buyer's damage for such breach is the difference in the market value at the time and place of delivery between the articles as they were and as they would have been had the warranty been complied with.—North Carolina Supreme Court, Cable Company *vs.* Macon, 69 Southeastern Reporter 14.

Damages Recoverable for Breach of Contract of Sale.—A buyer of iron in a building, on being wrongfully prevented by the seller from removing all of it within the time fixed by the contract, can recover the difference between the market value of the part not removed and the agreed price thereof, less the cost of removal, and not what he would have realized on a resale to third persons.—New York Supreme Court, Hirsh *vs.* Press Publishing Company, 126 New York Supplement 298.

Mutuality of Assent Necessary to Valid Contract of Sale.—Since no contract can be complete without the mutual assent of the parties thereto, an offer to sell or to purchase imposes no obligation until it is accepted according to the terms of the offer. An acceptance upon terms varying from those contained in the offer is, in legal effect, a rejection and terminates the negotiations, unless the party making the original offer acquiesces in the modifications proposed by the acceptance.—Minnesota Supreme Court, Bastian Brothers Company *vs.* Wemott-Howard Company, 129 Northwestern Reporter 369.

Buyer's Remedy on Breach of Warranty.—Where a contract for a sale requires the goods to be of good, merchantable quality, and before their arrival the buyer accepts the seller's draft for the price, the buyer can, as against the seller, refuse to receive the goods on discovering on their arrival that they are of inferior quality, and successfully defend suit by the seller on the draft.—New York Supreme Court, Ferguson *vs.* Netter, 126 New York Supplement 107.

Measure of Damages for Breach of Warranty of Machinery.—The measure of damages for breach of warranty of machinery sold is the excess of the value which the machinery would have had at the time of the sale, if it had complied with the warranty, over its actual value at that time.—South Dakota Supreme Court, Christiernson *vs.* Hendrie & Bolthoff Mfg. & Supply Company, 128 Northwestern Reporter 603.

Waiver of Shortage in Delivery Under Contract of Sale.—The seller of articles is entitled to recover the price of those actually delivered, if the buyer, with ample opportunity to know of the existence of a shortage, accepts delivery and invoice.—United States Circuit Court of Appeals, Southern District of New York, Lorraine Mfg. Company *vs.* Oshinsky, 182 Federal Reporter 407.

Reliance on Misrepresentation Essential to Right to Rescind Contract.—One cannot rescind his contract to buy personal property on the theory that the seller made certain misrepresentations in the negotiations for the sale, unless the buyer relied on such representations.—West Virginia Supreme Court of Appeals, Stalnaker *vs.* Janes, 69 Southeastern Reporter 651.

Liability for Goods Destroyed Pending Premature Delivery.—A buyer of goods having arranged for delivery not before September 1, and having refused to receive them before that time on account of lack of storeroom, cannot be deemed to have accepted them where they arrived August 11 and were burned in the railroad company's freight shed August 17, as affecting liability for their loss.—Maine Supreme Judicial Court, Aarons *vs.* Cummings, 78 Atlantic Reporter 98.

Employees' Assumption of Risk of Obvious Dangers.—An employer need not warn an employee against dangers pertaining to matters of common experience and observation, generally known to persons of his age and experience. An experienced boiler fireman assumed the risk of injury through explosion of the boiler furnace while using sawdust and shavings for fuel, though he had never used that kind of fuel before, his employer not being bound to warn him of the dangers attending use of such fuel.—Washington Supreme Court, Props *vs.* Washington Pulley & Mfg. Company, 111 Pacific Reporter 888.

Liability for Injury to Structural Iron Workers.—An employer's duty to furnish his workmen safe places in which to work does not extend to the construction of a building where the place is rendered unsafe by the work and the manner in which it is performed. Neither need he make rules that will protect the workmen against negligence of fellow employees in every situation that may arise, nor foresee mistakes of fellow employees. A foreman, a pusher, an engineer and a structural iron worker, employed in constructing a building, are fellow employees in the legal sense that they assume the risk of injury resulting from the negligence of each other in performing their respective duties, other than those of inspecting and repairing machinery and appliances.—New York Supreme Court, Stewart *vs.* Hinkle Iron Company, 125 New York Supplement 1073.

Risk Assumed as Incident of Employment.—If the place to which a sheet iron worker's helper was ordered to work was as safe as any other place in which he could have performed his duties, the dangers resulting from his position were incident to his employment, and he assumed the risk of injury arising therefrom.—Springfield, Mo., Court of Appeals, Henry *vs.* John O'Brien Boiler Works Company, 132 Southwestern Reporter 310.

Risks Arising from Latent Dangers Not Assumed by Employee.—An employee does not assume the risk of injury resulting from latent conditions unknown to him. An employer must use reasonable care to maintain his premises in a safe condition, and cause them to be properly inspected at intervals to ascertain their condition as to safety.—New Jersey Court of Errors and Appeals, Zellers *vs.* Delaney, 78 Atlantic Reporter 212.

Employers' Duty to Employees Sent on Premises of Another.—An employer who contracts to do work on the premises of another must use the same degree of care respecting the safety of his employees there as is required of him on his own premises. An employer cannot avoid liability to a workman for injury by intrusting to another performance of the employer's duty to furnish reasonably safe appliances. A machine company is liable for injury to a laborer caused by a falling of coils from which the supporting bolts had been removed, if the foreman knowing of the unsafe condition directed the laborer to work on them, the latter being ignorant of the danger.—Kentucky Court of Appeals, American Machine Company *vs.* Ferry, 132 Southwestern Reporter 546.

Duty of Employer as to Safety of Freight Elevators.—An employer owes a duty to the operator of a freight elevator to use ordinary care to keep the equipment in a reasonably safe condition, but need not furnish the best known appliances, it being sufficient to provide those ordinarily used in like circumstances.—New York Supreme Court, Scott *vs.* Nauss Brothers Company, 126 New York Supplement 17.

Risk of Injury Assumed by Employee.—An employee assumed the risk of being injured by slipping on a greasy floor or by losing his balance and falling into an open pit in the floor in which a wheel revolved, where the surrounding conditions had existed for several years during which he had been employed.—New York Supreme Court, Bauman *vs.* Schrumpf, 126 New York Supplement 482.

Scope of Rule Requiring Employer to Provide a Safe Place for Work.—The rule requiring an employer to provide a safe place for his employees to work does not apply where an employee is sent across railroad tracks on an errand, performance of which did not prevent him from looking out for his own safety.—New York Supreme Court, Matrusciello *vs.* Milliken Brothers, 126 New York Supplement 739.

Liability of Employer for Injury Resulting from Employees' Violation of Rules.—A manufacturer is not liable for the death of a foundry employee caused by being struck by pig iron through negligence of the operators of a pig breaker in bringing a bed of pigs over a platform when there was no car in position to receive them, where such method was a violation of the manufacturer's rules, and but for the violation the accident would not have happened.—Michigan Supreme Court, Barto *vs.* Detroit Iron & Steel Company, 129 Northwestern Reporter 15.

Liability of Employer Respecting Safety of Place of Work.—An employee cannot make a valid contract releasing his employer from liability for future injury caused by the latter's negligence. An owner of premises, on furnishing a contractor the place and appliances with which the contract is to be performed and retaining control over the appliances, is bound to the contractor and his employees to maintain the premises in a reasonably safe condition. A workman who remains at work in a dangerous place because of fear of discharge if he complains, does not assume any risk of injury other than those ordinarily incident to the employment. A manufacturer is liable for injury to an employee caused by negligent construction of piles of iron, or failure to trim the ends of iron bars handled by employees in a rolling mill, when such failure is apt to cause injury. He is not liable, however, for injury to a workman employed by an independent contractor in a mill under the contractor's control, caused by use of defective iron and failure to trim the ends of bars.—Missouri Supreme Court, Jewell *vs.* Kansas City Bolt & Nut Company, 132 Southwestern Reporter 703.

Employer's Duty to Workmen.—An employer need not furnish the best tools obtainable, it being sufficient to furnish reasonably safe ones. A manufacturer need not instruct an experienced workman how to use a tool employed in handling steel bars. A steel company was not negligent in not covering or protecting by railing a pit into which hot bars were dumped after being sheared, where such precaution was impracticable. In accepting employment involving dangers of which he knows, a workman assumes the risks ordinarily incident thereto.—Kentucky Court of Appeals, Flaig *vs.* Andrews Steel Company, 132 Southwestern Reporter 1015.

New Tools and Appliances

This is essentially a news department for which information is invited.

Special Engraving Machines.—For engraving names in automobile tire molds the George Gorton Machine Company, Racine, Wis., has built a new design of engraving machine, the special features of which are the frame and the work table. The cast iron mold ring used with this machine is mounted on a large circular work table and the revolving graver or cutting tool which is guided by a copy or master pattern cuts out the letters. The copy is clamped in a holder in the rear of the head and the outline of its enlarged letters is followed by a small pin in the arm of the pantograph reproducing mechanism which is controlled by the hand of the operator. As the letters of the copy are traced in this way they are reproduced in the mold ring on a smaller scale, the ratio of the reproduction being controlled by the setting of the pantograph arms. As the surface of the mold ring upon which the engraving is done is concave to conform to the shape of the tire, the cutter must be given a vertical movement in addition to its regular one in order that all parts of a letter shall be cut to the same depth. The spindle is held in contact by a spring with a small templet mounted above it which has the same radius as the curved part of the mold. This guides the spindle up and down as the cutter is moved across its convex surface and accomplishes the desired result.

Combination Press, Punch and Shear.—A combination trimming press, splitting shear and punch for either belt or motor drive is being manufactured by the Danville Foundry & Machine Company, Danville, Pa. This machine has been especially designed for establishments such as drop forge works where shearing, punching and pressing machinery is required. When the machine is motor driven the motor is mounted on a bracket attached to the rear of the frame. All the driving gears have cut teeth to insure quiet operation. A right and left hand screw enables the main crosshead to be adjusted to suit different classes of work and provision is also made for taking up wear by using adjustable V-shaped guides. When the knife holder is removed, a punch holder can be inserted for punching operations. The stroke of the press is 3¼ in. and the knives, which are 10 in. long, have four cutting edges. In order that long narrow bars can be sheared the main housing is left open in the back. The space between the housing is 12 in. and the depth is 8 in. The floor space required by the press is 4 ft. x 3 ft. 6 in.

Universal Grinder.—A universal grinding machine has been designed by the Morse Twist Drill & Machine Company, New Bedford, Mass., in which an effort was made to secure a durable and conveniently operated machine that would produce accurate results. Automatic reciprocating movement is provided for the table, and the point of reversal is controlled in the usual way by dogs. A lever in the front of the machine enables the table to be stopped at any point and moved by a hand wheel. A feed box attached to the rear of the machine and operated by a lever enables the rate of the table traverse to be changed quickly. Tapers as large as 1¾ in. per foot can be ground, as the table has a swiveling platen clamped at both ends and turning on a hardened and ground central stud. A scale is provided to indicate the taper and the adjustment is made by a screw at one end. The wheel has the customary swiveling base graduated in degrees and is adjusted by a hand wheel and a dial graduated to indicate thousandths of an inch on the diameter of the work. The wheel and the slide are held back by a weight which prevents any lost motion and gives an even and equal feeding movement. The automatic cross feed for the wheel will size work to within 0.0025 in. The wheel spindle is hardened, ground and lapped and runs in phosphor bronze bearings. Wheels 12 in. in diameter and from ⅜ to ¾ in. thick and 7 in. in diameter with a thickness of ⅜ in. can be accommodated. The head and the tailstock are clamped to the table ways by levers and the base of the former is graduated in degrees. Two shifter levers connect with the overhead shafting. One of these controls the drive for the wheel and the feed and the other the work and the pump. The work speeds may be varied from 50 to 480 in. and the wheel speeds range from 1025 to 3333 rev. per min. Both of these feeds have six changes and the traverse of the platen has ten changes, varying from 12 to 100 in. per minute.

Index Milling Machine.—An index milling machine which is particularly adapted for cutting spur gears or sprockets, notching operations, grooving shafts and gashing bevel gears and pinions preparatory to planing has been placed on the market by the Garvin Machine Company, Spring and Varick streets, New York City. The operation of the machine is entirely automatic and it will cut steel at the rate of 9 in. per minute with the cutter operating at a speed of 100 rev. per min. A special feature of the machine is the safety index device which automatically disengages the feed if the completion and the locking of the indexing are prevented by accident. The indexing is positive and together with the return of the table takes place at a constant speed. The proportions of the table are ample and a large chip basin is cast integral with the table. Index centers and fixtures having from 2 to 8 spindles, all of which index automatically and simultaneously, can be mounted interchangeably on the table. Multiple centers can be furnished to compensate for the variations in the diameters of gear and form cutters and as the spindles have individual micrometer adjustment very accurate work can be done. A large screw running in a trough of oil in which the nut also travels feeds the table, and the feeding and the indexing mechanisms are combined in one large gear box located in the front of the machine. All the gears run in oil and the box can be inspected by swinging down the front cover, while by removing four bolts it can be entirely taken out. Change gears located inside the front cover provide the necessary feed changes and the indexing change gears are mounted on the right side of the bed. The spindle is driven by a gear 20 in. in diameter. The spindle block has a vertical micrometer adjustment and is clamped in V-grooves by four bolts which bind the headstock and the block together rigidly. A large arm carries an intermediate arbor yoke and the outer end of the arm as well as the outboard bearing of the arbor is supported by a frame base bolted to the bed. The oil used on the work in operation passes through an overflow nozzle and an intermediate strainer into the reservoir in the base, from which it is fed to the work by a pump.

Twisted Steel Gaggers.—The Franklin Core Rod & Gagger Company, Franklin, Pa., has brought out a twisted steel gagger which is said to prevent the sand from dropping out of the molds. These gaggers are made from square steel rods twisted into a Z-shape. The special advantages of this form are that the twist in the rod holds the sand securely, while the distinctive shape of the gagger prevents it from being thrown out as scrap. Four sizes of device are made from ¼, ⅜, ½ and ⅝ in. square stock.

Pipe Die Stock.—The Hart Mfg. Company, Cleveland, Ohio, is placing on the market a new stock in which a single set of double end chasers are employed. One end is threaded 18 per inch and can be used for ⅛ and ¼ in. pipe, while the other is threaded 14 to the inch and is suitable for ⅜ and ½ in. pipe. A cam and stop are employed to secure this variation in size.

Tool Post.—A new tool post consisting of five parts has been brought out by the O. K. Tool Holder Company, Shelton, Conn. Forged steel is used in the construction of the post which is very compact and solid. The base has two serrated tongues fitting in slots in the second member. This member slides diagonally upon the base and teeth in the bottom of the slots engage with those in the tongues of the base. This sliding member has a shelf upon which the tool rests, a cap clamping the latter when the nut is tightened. By loosening the nut and sliding the upper member diagonally on the base, the tool can be adjusted to any desired hight, the teeth in the two parts holding them firmly in position.

Personal

Joseph F. H. Dixson, formerly secretary and general manager of the Federal Steel Foundry Company, has been appointed general manager of the Keystone Steel Casting Company, Chester, Pa., succeeding R. B. Farquhar, Jr.

Edward S. Kendrick, of Edward S. Kendrick & Co., Cincinnati, Ohio, has accepted the appointment of Northwestern sales agent of the Berwind Fuel Company, at Minneapolis, Minn., effective April 1. The Berwind-White Coal Mining Company, People's Gas Building, Chicago, is thereafter to receive communications pertaining to Berwind coal and coke formerly handled in Cincinnati territory by Edward S. Kendrick & Co.

The Bureau of Manufactures, Department of Commerce and Labor, Washington, D. C., announces that Durand C. Alexander, Jr., of New York, has been appointed commercial agent to investigate the export trade in machinery, machine tools, and other similar products in foreign countries. His first investigations will be made in the Orient, and his itinerary will probably include Japan, Philippines, China, India, and the Straits Settlements and Australia. Manufacturers who desire special matters investigated in these lines should communicate with the Bureau, which will welcome any suggestions which may be made with respect to subjects which might be covered by Mr. Alexander's investigations.

James M. Motley has resigned as president of Motley, Green & Co., Inc. His address in the future will be at 71 Broadway, New York, where he will continue to carry on personally the business of contracting for the supply of railroad and mining equipment and material.

John H. Baird, for over 25 years in the employ of the Joseph Dixon Crucible Company, has become treasurer and general manager of the New York & New Jersey Graphite Products, with headquarters at 253 Broadway, New York. Among the products marketed are crucibles, graphite, graphite paint, pencils, school and lumber crayons, Never Slip pulley preparation, foundry facing, &c.

E. Ronceray of the Société Anonyme des Etablissements Ph. Bonvillain & E. Ronceray, 9 and 11 Rue des Envierges, Paris, France, has been elected vice-president of the Committee of Admission and Installation, Group IV., of the Turin Exposition, including Class 23, various machine tools; 24, heating process and forging tools; 25, machine tools and small tools; 26, machines for various works; 27, machines for building materials. The company has a branch in Turin, with a select and relatively numerous staff, and is at the disposal of the exhibitors desirous to be represented during the time of the exposition.

J. E. Shull and associates have disposed of the controlling interest in the Shull Steel Castings & Mfg. Company, Canton, Ohio, and Mr. Shull has retired as treasurer of the company.

Henry D. Watson, formerly assistant manager of the New York branch of the Westinghouse Machine Company, has been made general Eastern sales manager of the Saurer Motor Company, 30 Church street, New York, manufacturer of industrial automobiles.

W. S. Chase, sales manager, and Paul Ryan, advertising manager, of the National-Acme Mfg. Company, Cleveland, Ohio, returned March 27 from a three months' sojourn in Europe on business.

Robert S. Alter, secretary of the American Tool Works Company, Cincinnati, O., sailed from New York this week for a two months' pleasure trip through Europe.

David E. Jackman, of the firm of E. S. Jackman & Co., Chicago, Cleveland and Pittsburgh, has withdrawn to accept the position of treasurer of the Firth-Sterling Steel Company, McKeesport, Pa., and will assume his new responsibilities April 1.

Cornelius T. Myers, sales manager of the Wisconsin Engine Company, Corliss, Wis., has resigned with the intention of engaging in business in Racine, Wis., as consulting engineer.

E. T. Hendee, assistant to the president of Joseph T. Ryerson & Son, Chicago, has returned from Europe.

I. L. Hughes has been appointed district superintendent of the Carnegie Steel Company's upper and lower Union mills, Youngstown, and the mills at Greenville, Pa., succeeding the late F. B. Baugh. A. W. Griffith has been made assistant superintendent.

William S. Pilling of Pilling & Crane, Philadelphia, has returned from a month's trip to the Pacific Coast.

F. W. Hudson of Chicago has been made superintendent of the Sharon, Pa., plant of the American Steel Foundries, succeeding C. W. Lytle, resigned.

Robert Bosch, Bosch Magneto Company, Stuttgart, Germany, arrived in New York March 21, and will spend several weeks here.

C. H. Todd, president of the Petroleum Iron Works Company, Sharon, Pa., has gone to Mexico on a business trip.

F. Mandon of the firm of Fenwick Frères et Cie, machinery dealers, Paris, France, is spending six weeks in the United States visiting machine tool manufacturers.

The Goldschmidt Thermit Company, 90 West street, New York, has enlarged its force of metallurgists by acquiring the services of Dr. E. A. Beck, who brings to his new position a varied experience. The company will give technical advice on all matters pertaining to the use of its metals and alloys in the production of special steels, brass and bronze.

Customs Decisions

Cast Iron Statues

In overruling a protest filed by Benziger Bros., New York, the Board of United States General Appraisers has fixed the classification under the tariff act of 1909 of cast iron statues. The statues, which are used principally for decorative purposes in Catholic churches, are imported with the marks of the mold removed. They are decorated by means of paint or coloring material, and are in all respects finished and ornamented figures. The samples submitted were finished to represent bronze. Collector Loeb classified them as "manufactures of iron not specially provided for," with duty at the rate of 45 per cent. ad valorem. Benziger & Co. alleged that a rate of eight-tenths of 1 cent a pound should be granted under the provision in the tariff for iron castings. It happens, however, that the second part of the castings provision imposes an additional tax of two-tenths of a cent a pound on castings which have been advanced in condition subsequent to the casting process.

The statues in controversy have, in the opinion of General Appraiser Fischer, been so advanced. Hence the claim for a rate of eight-tenths of 1 cent a pound is deemed by the board not well founded. The decision upholding the collector's assessment says that the board does not think it was the intention of Congress to cover, in the first clause of paragraph 147, articles which have been finished and decorated in the way these metal statues have been. Furthermore, the decision holds that the care and finish bestowed on the articles remove them altogether from the provisions of paragraph 147. Classification as "manufactures of iron" is affirmed.

In Monterey, Mexico, a magnificent hotel is being erected which will cost about $1,000,000, and will doubtless be the finest hotel in the republic. The owner is Don Fernando Aneira and the engineer and architect is Don Gustavo Trevino. An isolated electric plant will provide lighting for the building and power for motors for running elevators, pumps, and numerous other devices. The source of power will be two Westinghouse 100 kw. steam turbine outfits, with Babcock & Wilcox boilers. The turbines, which are being made by the Westinghouse Machine Company, Pittsburgh, Pa., are being supplied by the Cia. Ingeniera, Importadora y Contratiata, S. A., successors of G. & O. Braniff & Co.

Obituary

LORD AIREDALE (SIR JAMES KITSON)

Lord Airedale of Gledhow, better known in the United States as Sir James Kitson, died at Paris, March 16, aged 76 years. He was prominent in the manufacture of iron and steel in Great Britain and was senior past president of the Iron and Steel Institute. For many years he had been active in the affairs of the Institute, taking a leading part at most of its meetings. He presided at the Paris meeting in 1889; also at the meetings in New York and Pittsburgh on the visit of the Institute to the United States in 1890. He was a member of the Institute party which visited the United States in October, 1904, for the second American meeting of the Institute, which was held in New York, October 25 and 26, and at the opening session he presented the Bessemer gold medal to Andrew

LORD AIREDALE.

Carnegie. Lord Airedale was chairman of Kitson & Co., Ltd., operating locomotive works founded by his father and known as the Airedale Foundry, Hunslet, Leeds; also chairman of the Monk Bridge Iron & Steel Company, Ltd., Leeds, and a director of the Northeastern Railway Company. The Monk Bridge Iron & Steel Company manufactures Yorkshire iron and crucible and open hearth steel. Lord Airedale and his brother, F. W. Kitson, were patentees of the method for manufacturing solid weldless tires, which were produced in large quantities until superseded by steel tires. In 1862 the manufacture of steel tires was begun at the Monk Bridge Works, and the business has been carried on continuously, being now one of the foremost of its class in the United Kingdom.

CHARLES W. HUNT

Charles Wallace Hunt, an eminent engineer, died March 27 at his home on Staten Island, N. Y., aged 70 years. He was born in Candor, Tioga County, N. Y., in 1841, and took a scientific course at Cortland Academy, Homer, N. Y. Engaging in the coal business in West New Brighton, Staten Island, shortly after the Civil War, he was impressed with the high cost of handling coal. He worked out a scheme for an automatic railway for coal buckets or cars whereby coal could be dumped at any point on a trestle, the only motive power being that of gravity. He invented this system in 1871, and later built a factory in West New Brighton for making hoists and conveying machinery. This factory has for years been conducted by the C. W. Hunt Company, of which he was president. The business of the company has become very extensive, covering all parts of the United States as well as foreign countries. Branch factories have been established in Germany and England. Mr. Hunt was a prolific inventor of apparatus for use in hoisting and conveying, having taken out over 150 patents. He was a member of the American Society of Mechanical Engineers, filling the office of president for one term. He was also a member of the American Institute of Mining Engineers, American Institute of Electrical Engineers, American Association for the Advancement of Science, Municipal Arts and Science Association, New York Electrical Society, United Engineering Society, Franklin Institute, New York Chamber of Commerce, Staten Island Chamber of Commerce and of the Engineers', Hardware, Machinery, and Staten Island clubs, and vice-president of the Richmond County Savings Banks. He was married twice and leaves a widow, two sons and two daughters.

GEORGE A. BARNES, secretary of the Whitman & Barnes Mfg. Company, wrench manufacturer, Akron, Ohio, and manager of the Akron plant of that company, died March 22, aged 54 years.

The Erie City Iron Works, Erie, Pa., has sold to the Jones & Laughlin Steel Company, Woodlawn Works, twelve 400-hp. vertical water tube boilers; W. J. Rainey coke interests, Uniontown, Pa., eleven 300-hp. vertical water tube boilers and 3250-kw. Erie City Lentz 4-valve engines; Allegheny Steel Company, Brackenridge, Pa., a 200-kw. Erie City 4-valve engine.

The Asbestos Covered Metal Company, Boston, Mass., has recently purchased a building from the Keystone Driller Company, Beaver Falls, Pa., which will be remodeled and equipped with machinery for the manufacture of sheet iron roofing and siding to be covered with asbestos, for the purpose of making it an absolutely fireproof building material.

The Miller-Owen Electric Company will remove on April 1 from 107 Market street to 217-19 First avenue, Pittsburgh, where it will be better able to conduct its increasing business. The company specializes in new and second-hand electrical equipment for mills and factories and carries a variety of machinery in stock.

The Frick Company, Pittsburgh, will move its offices April 1 from the Fulton Building to the Jenkins Arcade Building. The refrigerating and ice-making machinery department is in charge of Otto C. Arens, while the lighter lines of machinery, including thresher and saw mills, are in charge of Walter Martin.

The Upson Steel Company, Cleveland, Ohio, expects to place its new steel plant in operation early in April. The 34-in. blooming mill and one of the four open hearth furnaces will be operated at the start. The bar mill will not be completed until about July 1.

The Grey Iron Foundry Company, Reading, Pa., has purchased from the receiver of the National Brass & Iron Works, of that city, all the patterns and molds for the latter's extensive line of art metal work, which it will be prepared to place on the market in the near future.

The Crosby Company, sheet metal stamping, Buffalo, N. Y., has opened a sales office at 717 Ford Building, Detroit, Mich., with Fred W. Coxe in charge, for the purpose of caring better for its growing Western business.

No. 1 Crane Furnace of the Empire Steel & Iron Company at Catasauqua, Pa., is being blown in this week after considerable repairs. For several months only one furnace of the Crane group has been in operation.

The Wadsworth Core Machine & Equipment Company, recently organized at Akron, Ohio, will be located at 10 West Buchtel avenue in that city. It expects to have its new plant in operation about April 10.

Tod Furnace of the Youngstown Steel Company at Youngstown, Ohio, which has been shut down for about six months, will probably be put in blast next week.

The Great Lakes Engineering Works, Detroit, Mich., has received an order from Boland & Cornelius, Buffalo, N. Y., for a 524-ft. freight boat.

The Western Electric Company's Earnings

The Western Electric Company's annual report makes the following showing for the last two fiscal periods:

	13 mos. ended December 31, 1910.	12 mos. ended November 30, 1909.
Gross sales	$68,375,150	$45,575,000
Cost of product	63,442,286	43,206,000
Net earnings	$4,932,864	$2,359,000
Other income	486,305	.....
Total income	$5,419,169	$2,369,000
Interest	884,893	280,000
Balance	$4,534,276	$2,089,000
Reserves	1,150,000	.....
Earned on stock	$3,384,276	$2,089,000
Dividends	1,700,000	1,200,000
Surplus for year	$1,684,276	$889,000

The balance sheet as of December 31, 1910, shows $739,541 reserved for pensions, $2,846,506 reserved for general purposes and $19,121,062 surplus.

In his accompanying remarks report to the stockholders, President H. B. Thayer states that for the 13 months to December 31, 1910, the number of orders received by the American offices of the company was 896,000, as compared with 695,000 in the preceding 12 months, and the average value an order was $72, as compared with $62.

During the year the work of concentrating at the Hawthorne plant the manufacturing work formerly carried on at the New York City and Clinton street, Chicago, plants has been continued. The manufacturing plants were worked to their full capacity during the year. For 1911 additions at Hawthorne have been authorized amounting to about $1,000,000 to provide for further concentration and additional facilities for the business. During the year the company sold its Clinton and Polk streets properties for $3,247,204. These properties were carried on the books at $2,759,971. The profit, $487,232, has been carried to reserves.

On January 1, 1911, the number of employees was 23,464, as compared with 17,835 at December 1, 1909. There are now 45 ex-employees on the pension roll, and the average pension paid is $713.64 per annum.

The total current assets, including sundry investments, less all liabilities except first mortgage 5 per cent. bonds, were $42,695,123 January 1, 1911. This is more than two and four-fifths times the total bond issue authorized and outstanding.

Railroad Equipment Orders.—The Louisville & Nashville has ordered 500 steel underframes for gondola cars. Of the order of the Atlantic Coast Line, 1400 box cars went to the American Car & Foundry Company and 50 steel underframe phosphate cars to the Standard Steel Car Company. The Western Maryland has placed orders for 23 passenger, baggage and mail cars. The Pere Marquette has placed its order for 50 locomotives with the American Locomotive Company. The New York, Chicago & St. Louis has ordered 15 locomotives, and the New York, Ontario & Western four locomotives of the American Locomotive Company. The Western Maryland has placed five with the Baldwin Locomotive Works.

"The Strength of Oxyacetylene Welds in Steel," by Herbert L. Whittemore, has just been issued as Bulletin No. 45 of the Engineering Experiment Station of the University of Illinois, Urbana, Ill. This bulletin gives the results of an extensive series of tests to determine the strength which may be developed in welded joints made by fusing thin steel plates together by means of the flame of an oxyacetylene blowpipe. It was found that with careful manipulation, such a welded joint may be expected to have about 85 per cent. of the strength of the plate material. Considerable information as to methods of manipulation of the oxyacetylene blowpipe and the proper regulation of the gases is also given in the bulletin, which may be obtained gratis upon application to W. F. M. Goss, Director.

The Maintenance of Way Convention

An exhibition under the auspices of the Railway Appliances Association was held in the Coliseum, Chicago, March 20 to 25, inclusive, showing one of the largest collections of railroad appliances ever brought together. It was made in connection with the annual meeting of the Railway Signal Association, which met March 20 at the Congress Hotel, and the twelfth annual convention of the American Railway Engineering and Maintenance of Way Association, in the same place, beginning March 21.

Practically every device used in the construction, maintenance and operation of a modern railroad, including safety appliances and many new devices of interest to the railroad engineer, was included in the display. Every available foot of space at the Coliseum, including balcony and annex, was occupied by the exhibits of nearly 200 manufacturers. Railroad engineer experts from all parts of this and many other countries were in attendance, and technical problems connected with the engineering department of railroads were beneficially discussed at the various meetings.

A feature of unusual interest at the Coliseum was a model of the gyroscope monoplane car, which was exhibited by the Central Scientific Company, Chicago. This little model, perfectly balanced by two heavy grostats or flywheels, mounted side by side on the car and spinning in opposite directions, was a feature that never lost its attraction to the crowds who watched it on its single wire rail. The model was 14 in. in length, weighing about 140 lb., and its power of being able to right itself under any load, however unevenly distributed, was keenly studied.

Marked progress continues to be made by the manufacturers of railroad equipment. Signal apparatus has been improved probably as much as any other one branch of railroad appliances, and the fact that railroad officials continue to install such up-to-date apparatus in the face of conservative buying campaigns demonstrates this year the power of signals in decreasing the cost of operation. The American Railway Engineering and Maintenance of Way Association and the Railway Signal Association have both made remarkable showings in the past year and, directly as a result of their efforts, the railroads have outstripped splendid records of the past which have marked their yearly improvement.

A Large Surplus of Idle Cars.—The American Railway Association bulletin shows that on March 15 the net surplus of idle cars on the railroads of the United States and Canada was 207,527, an increase of 17,419, or 9 per cent. over March 1. The present surplus is four times that of one year ago. With allowance for the additional equipment in service, the number of idle cars is probably twice what it was in March, 1910.

Among literature representing the manufacturers' view of accident compensation, now being circulated in Ohio in connection with the bill now pending in the Legislature, is the paper on "The Personal Equation in Accidents" prepared by Thomas D. West for the Detroit meeting of the American Foundrymen's Association. It was published in *The Iron Age* of June 16, 1910, page 1440. The substitute compensation bill recently reported by the Judiciary Committee of the Ohio house has made several changes in the one originally introduced. One of these is the elimination of the provision by which the courts be directed to impose a double penalty in case of a judgment against an employer not insuring under the act.

The Canton Sheet Steel Company, Canton, Ohio, has purchased the plant of the American Sheet & Tin Plate Company in that city that was wrecked by a boiler explosion several months ago and which has since been practically dismantled. The site was acquired for use in future developments of the purchaser.

An Important Commercial Automobile Consolidation

The consolidation is announced of the American Motor Truck Company, Lockport, N. Y.; Lockport Stamping Company, Lockport, N. Y., and Findlay Motor Company, Findlay, Ohio. The plants of the first two named are now being moved to the Findlay plant, which is a large and modern one. Up to the time of this consolidation the Findlay Motor Company had been engaged in the manufacture of the lighter type of motor delivery wagons, consisting of a 500 to 750 lb. two-cylinder car and a 1000 to 1500 lb. four-cylinder car. The American Motor Truck Company's product has consisted of three standard classes—a five ton, a three and a half ton and a two ton, all four-cylinder type—and it will now add to its line a one ton carrying capacity truck. The Lockport Stamping Company has been engaged in the manufacture of automobile radiators, both for pleasure and commercial cars, the Findlay Motor Company taking a large portion of its output. The merger will give the Findlay Company facilities for making its own radiators as well as supplying several other prominent automobile concerns.

The executive offices of the consolidated concerns will be at the Findlay plant, but the business of the American Motor Truck Company will be run under the same name and management as heretofore. L. E. Ewing, president of the Findlay Motor Company, has been elected president of the American Motor Truck Company to succeed Charles R. Bishop, resigned. E. B. Olmsted remains the vice-president and general manager of the company. The other officers are unchanged.

The Findlay Motor Company is possessed of a large tract adjoining its present large up-to-date plant. Negotiations are already on foot looking toward the erection of extensive additions to take care of the incoming factories, and to provide for the rapidly increasing business of all of them. With the line of commercial trucks from 750 lb. capacity up to five tons, made in one plant, a line which has been thoroughly tried out in actual service for years, there will be a great increase in the business of Findlay. The combination of the three companies brings together not only three large manufacturing plants, but represents the concentration of the combined capitals of the three companies, and it is safe to predict that the Findlay alliance is destined to make itself felt in the trade.

The Baldwin Locomotive Works' Earnings

The Baldwin Locomotive Works reports to the New York Stock Exchange for the year ended December 31, 1910, as follows:

Sales	$29,057,998
Cost	25,697,273
Manufacturing profit	$3,360,725
Dividend, Standard Steel Works	600,000
Receipts from other sources	407,778
Gross profit	$4,368,503
Charges, taxes, &c.	856,929
Balance	$3,511,574
Maintenance of plant and depreciation	994,894
Net profit	$2,516,680
Dividends	1,026,000
Surplus	$1,490,680

The general balance sheet as of December 31, 1910, shows cash on hand $1,861,194 and other quick assets $17,185,723, with current liabilities $6,278,858. The capital surplus is $4,020,112 and other surplus $1,645,036. The common stock outstanding is $9,200,000; preferred, $10,800,000; bonds, $10,000,000.

The Sandusky Foundry & Machine Company, Sandusky, Ohio, has closed a deal for the purchase of the plant of the Warren Electric Mfg. Company in that city and will move to its new quarters about April 1. The new plant will provide the company with much greater capacity than is afforded by its present quarters. Its principal products are paper mill machinery and power pumps. Some additional lines may be added. W. H. Millspaugh is president.

An Iron Roof Still Good After 40 Years

The Empire Iron & Steel Company, Niles, Ohio, manufacturer of black and galvanized sheets, is sending out photographs showing a sheet iron roof which has given perfect satisfaction for 40 years. When such a roof actually outwears the building upon which it was placed so many years ago, the circumstances connected with the case should indeed be of general interest to sheet metal men. The roof is on a warehouse belonging to the Globe Foundry & Machine Company, Niles, Ohio, of which W. B. Carter is general manager. The roof was placed at the time the building was erected in 1871. It is of the old-fashioned iron made before the open hearth and Bessemer processes were commercially known in the manufacture of steel for sheets in this country. The last coat of paint was applied between 20 and 25 years ago and during all these intervening years the roof has been practically devoid of surface protection. The photograph shows ragged edges on the eaves caused by the roof at those points being loosened and fragments blown off during a series of violent storms some months ago. This slight damage, of course, does not affect the protection still afforded the building by the roof proper. Deepest interest lies in the peculiar fact that the warehouse itself is a near wreck while the roof, which has undergone the same bombardments of nature, is still intact and giving service. This case seems to reverse the accepted order of things and change the phrase "several roofs during the life of the building" to "several buildings during the life of the roof." It appears to prove convincingly the superior wearing qualities of good old-fashioned iron roofing.

Labor Notes

The National Founders' Association publishes a list of firms involved in union molders' strikes in the United States and Canada in the past three years, designating them as strikes in which the Molders' Union has given financial support to its members in the year 1910 and thus far in 1911. The list is made up without reference to the membership of the firms affected in the National Founders' Association. No condensed statement is made of the number of men involved in strikes which were unsuccessful, nor is the total given of those in which the union carried its point. However, a general strike summary is given for the period from March, 1904, to March, 1911. For these seven years the figures are as follows:

Foundries affected	540
Union members involved	16,378
Foundries involved in compromises	45
Union members involved in compromises	1,342
Foundries involved where strikes have been lost to union	436
Union members involved where strikes have been lost to union	13,471
Foundries involved where union has been successful	66
Union members involved where union has been successful	1,718
Foundries involved where strike benefits are still being paid	86
Union members involved where benefits are still being paid	2,252

The differences between the Goulds Mfg. Company, Seneca Falls, N. Y., and its molders relative to the operation of molding machines have been adjusted, the 100 molders and coremakers who went on a strike returning to work last week.

A public conference will be held in the United Engineering Building, 29 West Thirty-ninth street, New York City, April 8, to consider the important subject of the relation of the national and State governments to the conservation and utilization of water powers. Two sessions will be held, afternoon and evening, and papers and addresses will be delivered by several well-known men. The National Electric Light Association has issued a partial list of topics, which will be discussed at this meeting.

Steel Foundry Practice

Notes on Open Hearth Furnace Work, Covering Both Metallurgy and Molding

BY EDWARD HERMS, WILKINSBURG, PA.

The following notes are based on an experience in steel foundry practice in the St. Louis and Pittsburgh districts as chemist, furnaceman and superintendent:

Acid and Basic Steels

Acid steel is not as desirable as basic steel where shrinkage is an important factor in causing cracks, as in the casting of bolsters for cars, charging machine boxes, cast steel ladles, annealing boxes, and the like; for the general run of acid steel is more liable to crack than a low phosphorus basic steel. The reason for this is not so clear, as the slightly larger percentage of sulphur in acid steel—which sulphur content tends to red shortness—can hardly account for this tendency to crack; for in reality in basic castings it is found that cracks are related to the phosphorus content, and that castings that will crack with 0.040 phosphorus will cease to crack or show much smaller cracks at 0.015 phosphorus content, without any variation in the sulphur content. These cracks are not cold cracks, but hot cracks. It is always aimed to get the phosphorus content low in plants that make a specialty of railroad castings in order to avoid the cracks. Two foundries in the St. Louis district tried acid steel for making bolsters, but were compelled to give up the practice. The fact that acid steel is more prone to crack may be due to its greater density and consequent greater shrinkage.

To make low phosphorus basic steel, it is necessary to have as little silica as possible in the charge. The pig iron must be low in silicon—the lower the better, and 1 per cent. is the limit generally allowed; the scrap should be low in silicon; also the limestone should be low in silica—better under 1 per cent. Magnesia does not make a good slag, and should be low in the limestone. Of course, the phosphorus and sulphur should be low. The more impure the limestone the more will be needed, and the excess is only a barrier to the working of the heat as it is a poor conductor, preventing the heat from entering and endangering the furnace. As much as 18 per cent. limestone to the charge is used where the charge runs high in phosphorus, as with Southern pig, which runs close to 1 per cent., and in this case it is not uncommon to get under 0.010 phosphorus in the finished steel. With 0.40 per cent. phosphorus in the pig iron, 14 to 15 per cent. of limestone to the charge is sufficient. It is customary to make a preliminary phosphorus before tapping a basic heat, and if the phosphorus is found too high, it is reduced by adding unslacked lime in small lumps after the bath is first given some action by adding pig iron or spar. It is found that iron ore, pig iron and spar added together to a very low carbon will reduce the phosphorus. By working the heat with an oxidizing flame, the phosphorus is readily removed and often absent when the heat is thoroughly melted.

Additions to the Bath

The limestone is charged on the bottom or the bottom is first covered with scrap to prevent the limestone from adhering. When the charge is melted there will be a violent boiling on the bottom until all the lime is up and floating on the charge in large chunks. The heat is then worked by giving it lumps of iron ore in suitable quantities so as not to cause foaming or unnecessarily cooling of the heat by large disengagement of gases. The chunks of lime floating on the surface, under this influence, are gradually converted into slag. Fluorspar will hasten this process of dissolving the lime, but it must not be added until the carbon in the bath is under 0.40, for otherwise the bath will foam and delay the heat. This foaming of the heat has some relation to the iron ore used, for it appears that with a high carbon the iron ore does not reduce the carbon as rapidly as with a lower carbon, and thus that the gases generated must be held in solution. True it is that the activity of the bath is greater, the lower the carbon until a lower limit is reached. This gas the fluorspar seems to loose, which, with the viscidl slag, causes foaming. With a foaming heat there is nothing to do but to wait until the foam subsidies. Flourspar can be added slowly to a high carbon bath to which no ore has been added, which is the practice in making high carbon basic heats. Pig iron also causes foaming when added to a high carbon basic heat to which ore has been added. Any cold metal added to the bath at any time causes disengagement of gas, but not always any considerable foaming. Thus it is a good practice to add cold metal, as pig iron, at the close of the heat to disengage the gas and thus help kill the bath, making more solid castings. Ferrosilicon, 10 to 12 per cent., is also good for this purpose, and it is a common practice to add 500 to 800 lb. to a bath of 20 tons just before tapping. Much more can be used with good effect in making high carbon basic steel come solid, and it is well to preheat the ferrosilicon in a little furnace for that purpose. In this way 1500 to 1800 lb. can be used in a 20-ton bath in making high carbon rolls, and will bring solid castings. The increase in phosphorus from the ferrosilicon, when using good materials, is insignificant.

In making nickel steel castings it is well to add the nickel to the bath when the carbon is low, a little before the final additions of manganese and silicon. If nickel scrap steel is used, it is well to make a preliminary nickel test just before tapping, so that the final nickel content can be safely assured. There is no loss of nickel to the slag, and an acid or basic hearth is equally applicable.

Care must be taken in making additions to the ladle that they are all dissolved before the slag enters the ladle, for if added too late the last few castings may be very high in silicon or manganese, or both, causing the castings to be brittle. The last 1000 lb. of steel from the ladle of a basic heat is rather inferior, being high in phosphorus. The basic ladle should not contain too much slag over the metal, as this hot slag is apt to cut the sleeves off the stopper rod if the heat is long in pouring. This can be partly adjusted by adding or removing brick from the ladle lipspout. The nozzle should be well preheated to prevent the sticking of the stopper.

To Prevent Piping and Shrink Holes

A good plan to prevent piping and shrink holes is to cover the heads just as soon as filled with blacklead or plumbago. This will prevent a crust from forming and keep the metal liquid, so that it will sink down to feed any shrinkage of the castings. Charcoal will also keep a head open if stirred with an iron rod; but anthracite will not do, as it is absorbed more freely and is apt to raise the carbon so as to make it difficult to cut-off the heads unless this is done with an oxygen blast. In making rolls of acid and basic steel, it is found that acid steel gives the largest pipe. With care basic high carbon castings, including rolls, can be made to come solid up to 1.10 and 1.25 carbon.

The analysis of castings varies somewhat with their purpose. Where high physical properties are required and the steel must withstand shock to a high degree, the carbon and phosphorus must be low. For bolsters 0.18 to 0.23 carbon is good with phosphorus as low as possible, preferably under 0.025. The manganese is desired

above 0.70 and under 0.85, although 0.90 is not bad with a low carbon. Silicon ranges from 0.25 to 0.35, and even 0.40. When castings must be machined, soft steel includes anything, roughly speaking, up to 0.30 carbon, and it is well to have the manganese and silicon well up to insure solidity. A little aluminum added to the metal as it enters the pouring cup will help much to insure solidity.

Molding Conditions

The condition of the liquid steel is not alone responsible for solid castings, for the condition of the mold is equally important. There must be plenty of vent in the mold, for if the vent is poor the steel will come with blowholes. This vent is interrupted by a dense mold or dampness. Dampness seems to be the worst enemy. Acid steel will not come solid in green sand much more than basic steel, yet by adding sufficient aluminum to the metal as it enters a well-vented mold, a degree of solidity can be attained that is satisfactory for much work. Dampness seems to be the principal cause of the facing burning into the mold or the steel hardness of certain cores, which makes it all but impossible to remove them. Yet an excess of fireclay will cause this trouble as well as a low class of core materials. Scabbing is often caused by dampness. All cracks are not due to the condition of the metal, but the manner of gating, the design of the pattern and the hardness of the facing are important. By distributing the flow of metal into the mold more uniformly, thus preventing a hot streak or line of weakness, while most of the metal has chilled, will often obviate a crack.

The sand for molding should be silica sand of high silica content, the higher the better. Sharp sand is not so desirable for green sand work. The silica should run above 97 per cent. Various degrees of fineness have been used with success, although it is understood the sand should be rather coarse. The fireclay to mix with this sand should be refractory and of high tensile strength, especially in green sand work. There are three kinds of bond in fireclay; the stickiness in the wet condition, that of the air dried condition, and finally that developed by firing. The first kind is essential to green sand work, the first two are right for dry sand work. The St. Louis district possesses the finest clays of the first class, and this together with the pure silica sands of this district is largely responsible for the degree of success which green sand work has attained there. If a natural sand of sufficient tensile strength could be found of a coarse texture and about 3 to 4 per cent. alumina and 93 per cent. silica, with 3 per cent. combined water and little other impurities, we would have an ideal molding sand. If the alumina runs high in the sand, the silica and alumina will flux from the high heat of the steel and burn into the surface of the casting. Dry sand molding mixture requires less clay than green sand, for here the molasses water or glutrin furnishes the bond by drying and baking. There is much foundry flour on the market that contains large quantities of carbonate or sulphate of lime, even up to 50 per cent. of the impurity, and this is objectionable as a steel foundry material because of its fluxing and fusible properties. The sand mixtures are preferably mixed dry, as only thus will the clay penetrate the mass the more thoroughly. Steel castings can be made to peel clean, so that very little grinding and chipping are necessary, and this is attainable when good facing is used.

The Buffalo Forge Company, Buffalo, N. Y., has closed a contract with the Anheuser-Busch Brewing Association, St. Louis, for an equipment of Buffalo downdraft forges with the necessary fans and motors. Among other recent purchasers of similar equipment are the Weyher Wagon Works, Wausau, Wis.; Bradley Polytechnic Institute, Peoria, Ill.; Shaw University, Raleigh, N. C.; Palmer & Singer Mfg. Company, New York City, and Flat Automobile Company, Poughkeepsie, N. Y.

The Morgan Engineering Company, Alliance, Ohio, has purchased an interest in the Shull Steel Castings & Mfg. Company, Canton, Ohio.

February Iron and Steel Exports and Imports

A decrease both outward and inward in our foreign trade in iron and steel and manufactures thereof is shown by the February report of the Bureau of Statistics, Department of Commerce and Labor. The total values of these commodities, not including ore, exported in February was $18,690,792, against $18,739,961 in January. The value of similar imports in February was $2,145,803, against $2,874,740 in January.

The exports of commodities for which quantities are given aggregated 150,702 gross tons in February, against 152,140 tons in January. Details of the exports of such commodities in February and for the eight months of the current fiscal year ending with February, compared with corresponding periods of the previous year, are as follows:

Exports of Iron and Steel.

	February,		Eight months ending February,	
	1911.	1910.	1911.	1910.
Commodities.	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	14,939	3,033	111,463	45,402
Scrap	3,761	275	22,813	7,267
Bar iron	831	767	10,557	8,602
Wire rods	1,186	1,019	10,929	13,217
Steel bars	11,841	6,874	79,119	56,791
Billets, blooms and plates	23,453	1,596	85,883	48,699
Steel rails	13,880	34,486	225,555	255,431
Iron sheets and plates	6,332	8,586	63,906	59,058
Steel sheets and plates	15,950	14,105	119,535	85,680
Tin and terne plates	2,213	828	10,830	6,677
Structural iron and steel	18,222	9,476	102,081	63,009
Barb wire	5,128	4,830	53,815	47,426
Wire	7,582	4,929	63,424	48,531
Cut nails	570	409	6,372	6,455
Wire nails	3,838	4,188	30,348	22,502
All other nails, including tacks	1,108	552	7,595	5,014
Pipe and fittings	13,568	13,819	109,544	114,676
Totals	150,702	109,772	1,113,769	894,437

The imports of commodities for which quantities are given aggregated 20,454 gross tons in February, against 32,795 tons in January. Details of the imports of such commodities in February and for the eight months of the current fiscal year ending with February, compared with corresponding periods of the previous year, are as follows:

Imports of Iron and Steel.

	February,		Eight months ending February,	
	1911.	1910.	1911.	1910.
Commodities.	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	11,157	16,468	147,514	156,805
Scrap	2,370	14,092	18,081	94,393
Bar iron	2,572	3,208	21,116	17,446
Billets, bars and steel forms n.e.s.	2,341	2,135	27,473	20,217
Sheets and plates	134	384	2,846	4,074
Tin and terne plates	873	5,661	36,970	43,752
Wire rods	1,007	1,665	12,676	7,623
Totals	20,454	43,613	266,676	344,310

The imports of iron ore in February were 94,820 gross tons, against 102,600 tons in January and 170,427 tons in February, 1910. The imports of ore in the eight months of the fiscal year ending with February were 1,529,185 gross tons, against 1,577,600 tons in the corresponding period of the previous fiscal year. Of the imports in February, 80,100 tons came from Cuba, 8826 tons from Spain, 5729 tons from Sweden and 165 tons from Canada.

The total value of the exports of iron and steel and manufactures thereof, not including ore, in the eight months of the current fiscal year ending with February, was $142,289,601, against $111,184,177 in the corresponding period of the previous year. The total value of similar imports was, respectively, $23,298,159 and $24,157,560.

The Carroll-Forter Boiler & Tank Company, Pittsburgh, has started up its plant at Wellsville, Ohio, which was shut down for four weeks, on a contract for 600 tons of riveted steel pipe to be sent to Portland, Ore., for use in the construction of a water power system.

Steel Rail Failures

The Report of the Maintenance of Way Association's Committee—Troubles Traceable to the Ingot

An important feature of the proceedings of the American Railway Engineering and Maintenance of Way Association at the Chicago convention session of Wednesday, March 22, was the voluminous report of the Committee on Rail. The statistics of rail failures submitted by the committee, were for the six months ending October 31, 1909, and are referred to as the most complete information on the subject ever published. The committee says that an important deduction from these statistics is that differences in the production of ingots and the finished rail made from them may annihilate all advantages derived from any particular rail section; "The design of rail section," the committee says, "is not, therefore, the main cure for poor material." A summary of present practice in the rail mills of the United States was presented, as given in a chart prepared by Robert W. Hunt & Co. It is reproduced herewith.

A Summary of American Steel Rail Practice. Compiled by Robert W. Hunt & Co., December 12, 1910.

MILL	LOCATION	KIND OF STEEL	NO. OF CONV. OR FURNACES	SIZE OF INGOTS AT BOTTOMS	NOM. NO. INGOTS PER HEAT	NOM. NO 90ft RAILS PER INGOT	BLOOM MILL ROLL HIGH	NOM. NO. PASSES BLOOM MILL	BLOOMS RE-HEATED	NO. OF PASSES RAIL MILL TRAIN	TOTAL PASSES INGOT TO RAIL	NO OF HOT SAWS	NO EXTRA HOT SAWS	DIS FROM FIN ROLLS TO NEAREST HOT SAW OF ONE COM USED	SEL TIME BETWEEN 1ST SAW AND LEAVING FIN ROLLS	BRAND ON TOP OR BOTTOM	BRAND OR RAIL READS FROM — TO — OF INGOT	
ALGOMA STEEL CO	ST STE MARIE CANADA	BESS. O H	2 3	18 x 19½	2 15	4-5	2	17	YES	11	28	1	1	113'	25-30	BOTTOM	TOP (GENERALLY)	BOT
BETHLEHEM STEEL CO	BETH'M PA	O H	10	19 x 23	25	6	2	15	NO	11	26	1	1	270'	35-40	-	BOT	TOP
CAMBRIA STEEL CO	JOHNSTOWN PA	BESS O H	4	19¾ x 22¾	4	5	2	15	YES	12	27	4	0	77'	15-20	-		
CARNEGIE STEEL CO	BRADDOCK PA	BESS	4	18½ x 19½	7-8	4-5	3	7	YES	13	20	4	0	43'	12-16	-	BOT.	TOP
COLORADO FUEL & IRON CO	PUEBLO COL	OH	12	18 x 20	30	4	2	15	NO	10	25	1	0	105'	25-30	TOP	TOP	BOT
DOMINION IRON & STEEL CO	SYDNEY NS CAN	O.H	10	18½ x 21½	18	6	2	17	NO	11	28	1	0	107'	10-15	BOTTOM	TOP	BOT
ILLINOIS STEEL CO	GARY IND	O.H	28+	20 x 24	24	7	3-2	9	NO	9	18	5	0	158'	12-18	-	BOT	TOP
ILLINOIS STEEL CO	SO CHICAGO ILL	BESS	3	18½ x 19	6-7	4	3	9	NO	9	18	5	0	96'	10-15	-	BOT	TOP
LACKAWANNA STEEL CO	BUFFALO NY	BESS. OH.	4 12	19 x 19	6 34	4	2	6	NO	9	15	1	1	232'	12-18	-	TOP	BOT
LORAIN STEEL CO	LORAIN O	OH	6	22 x 26	20		2		YES									
MARYLAND STEEL CO.	SPARROWS PT'D	BESS. O.H.	3 3	19 x 21	6 16	5-6	2	13	NO	11	24	1	1		28-32	-	BOT	TOP
MONTEREY IRON & STEEL CO	MONTEREY MEX.	O.H	4	17 x 22	16	4	2	15	YES	10	25	1	0	205'	40-50	TOP	-	-
PENNSYLVANIA STEEL CO	STEELTON PA.	BESS. O.H.	3 3+	18½ x 18½	30	4	3	9	YES	11	20	2	1	8'	10-14	TOP		
TENN. COAL, IRON. & RR CO	ENSLEY ALA	O H	8	19 x 23	30	6	2	11	NO	10	21	4	0	113'	15-20	BOTTOM	TOP	BOT

Figures above represent nominal practice.

* Refers to time consumed from rolls until first rail is cut.

Lorain rolls chiefly girder and high tee rails. In two-high blooming mills, rails may be given more than number of passes above. For Pennsylvania Steel Company, above is for standard sections only. Tennessee and Dominion make duplex process steel. Maryland steel may be by duplex process. Carnegie Steel Company may roll open hearth steel from Homestead.

No New Rail Sections

It is admitted by the committee that to determine upon a set of specifications that will bring about the manufacture of "good steel rails," is an intricate matter, involving the making of many tests. While no rails have been purchased as yet under the committee's tentative specifications, the differences between them and the specifications used by some of the large railroad systems are not very great and are being constantly reduced. No new sections will be recommended for the present, as the results of service with the type A and type B rails of the American Railway Association are awaited. The former is the high stiff design with thin head and the latter, the lower and more flexible design, with heavy head. It is stated that the study on strength of rail head made in the past year by Max H. Wickhorst, engineer of tests for the committee, was intended to throw some light on the controversy over the thin head and thick head. It was also expected to give some information "relative to the claim that the head of a rail is broken down by the excessive equipment loads of the present day, even though there be no physical defect in the interior of the rail head." In an accompanying report, Mr. Wickhorst tells of his tests to determine the strength of rail head, but the results are inconclusive, though he says it is hoped to determine in future tests the maximum load which each thickness of head will carry. After planing pieces of rail down to thicknesses of head at the side, ranging from ⅜ in. to 1 in., loads were applied and the sag measured. A load of 30,000 lb. seemed to cause a permanent sag with a ⅜-in. head, but not much, if any, with heads of greater thickness. It was noted that the web seemed to stand the load of 200,000 lb. successfully.

The committee says that it desires to make a closer study of ingot making, "as the principal defects connected with rail manufacture seem to have their origin in the making of the ingot. It is true that the temperature of the bar during manufacture and the amount of work done upon it have a strong effect on the subsequent quality of the finished rail, but the studies of the committee lead it at present back to the ingot as the source of our most serious defects, viz.: brittleness, unsoundness and segregation." A study will also be made of the relationship of the chemistry to the deflection under the drop, also to take up elongation as related to permanent set, so as to take account of ductility in accepting or rejecting rails, as is now being done by Dr. P. H. Dudley for the New York Central Lines.

Six Months' Statistics of Rail Failures

One appendix to the committee's report gives the following summation of rail failure statistics for the six months ending October 31, 1909. The statistics are for the greater number of the large railroad systems and the number of tons reported is 7,445,825:

Taking all the reports, the failures are divided into: Broken, head failures, web failures and base failures, according to the following percentages: Broken, 19 per cent.; head, 66½ per cent.; web, 8½ per cent.; base, 6 per cent.

The figures do not show that the breakages of the heavy sections are fewer than the lighter sections, except in the case of 75-lb. rail. The head failures, however, of the 100-

lb. rail seem to be materially less than those of 90-lb. and 85-lb. rail. With the Bessemer steel the head failures are the most numerous, those for the 90-lb. being slightly more numerous than for the others. Those for 85-lb. and 100-lb. rails come next, and are nearly the same. The number of breakages is closely the same in all cases, while the web and base failures are quite insignificant. With the open hearth steel the head failures of the 80-lb. rail are the most noted. In drawing comparisons between different sections of Bessemer rail, the head failures of P. S. 85-lb. rail are the most noticeable, amounting to 35.8 per 10,000 tons laid, but the explanation given is that they are principally from a lot of 2045 tons on the Northwest system of the Pennsylvania Lines west of Pittsburgh of Carnegie 1909 rails. During the month these rails were rolled many defective heats were found, indicating that the failures were caused by the quality of the material and not the rail section. Broken rails are comparatively few, the most noticeable being the C. S. 75-lb. and then the P. R. R. 100-lb.

In comparing the sections of open hearth rail, the head failures are the most numerous in the A. S. C. E. 90-lb., G. N. 85-lb., C. S. 90-lb. and A. R. A. B. 90-lb. There is considerable difference between the A. R. A. A and the A. R. A. B 90-lb., but it will be found that the greater number of failures come from Bethlehem, which simply happens to be in this case the A. R. A. B section. The failures of the same section of rails from the Gary mills are much less in number. This last statement gives the clue to the real cause of the failures, and further studying into these statistics will bring out this fact more strongly, viz.: That the cause of failures is in the quality of the material and not the design of the rail section.

In making a comparison of failures for different lengths of time, it is pretty generally known that most of the failures of any lot of rails occur in the first four years.

The marking of the rails to distinguish the position in the ingot has become very general, but, of course, the position of most of them is still unknown. In general the failures of A rails are the most numerous, but it is noteworthy that there are many failures down to D and E, and occasional ones in F. In some cases they are very numerous in D rails.

A Study of Forty Failed Rails

In another appendix the committee presents a report made by W. C. Cushing, covering a study of 40 rails which failed in the main tracks on the Southwest system of the Pennsylvania lines west of Pittsburgh in the year 1909. Sixteen broken rails were examined and 13 out of the 16 were broken in or at the splices. A study of 24 rails which failed from crushed or split heads showed that all of the failures were caused by hard, brittle, unsound or segregated metal or a combination of two or more of them. "In three cases investigation showed that foreign material was rolled in the rail section. In one case it was very apparent that this foreign material was an old tie plate. The trouble appears to have occurred from the practice at the Gary mill of throwing pieces of scrap on the stool to prevent its cutting during the casting of the ingot. Mr. Cushing concludes that these 40 cases of rail failure point out very clearly that the prime cause of rail failures is the poor quality of the material, as indicated by hardness, brittleness, segregation and unsoundness, all of which must be corrected in the ingot. Only two cases of faulty rolling were found in this lot."

Concerning a report made by Mr. Cushing on 68 additional rails which failed on the Southwest system of the Pennsylvania lines west of Pittsburgh, except a few which failed on the Rock Island system, the committee says:

> From this study Mr. Cushing concludes that it is quite clear that of the new rail sections neither the P. S. section with the heavy head, nor the A. R. A. A section with the thinner head, has yet brought about and improvement in the quality of the metal by reason of better proportionate distribution of the material in the head, web and base, respectively, in the hope that the conditions of rolling will be so improved as to produce sound material. The defects must be remedied at the blast furnace [sic], and the changes of improvement must bring about less segregation of the elements and smaller inclusion of gas bubbles and slag in whatever way the results are to be accomplished, whether it be by more time for the mixing of the elements and the escape of the gas or in some other way not yet discovered.

Rolling Conditions Relatively Unimportant

Extended reports were made to the committee by Mr. Wickhorst, covering 11 subjects investigated. Six of these reports deal with tests of rails at various works—Bessemer rails of the Maryland Steel Company, Illinois Steel Company and the Carnegie Steel Company, titanium Bessemer rails of the Lackawanna Steel Company, and open hearth rails of the Gary works of the Indiana Steel Company. From Mr. Wickhorst's comments the following are taken:

> *Segregation.*—When molten steel is poured into the ingot the different constituents that compose the liquid mass do not stay together when solidifying, but the carbon, phosphorus and sulphur tend to collect or "segregate" toward the interior and upper part of the ingot. The region of maximum segregation seems to correspond in location with the brittle zone developed by the drop test. The tests indicate that a small amount of segregation is not harmful, but the allowable limit has not been determined. The problem of ingot making apparently consists in controlling segregation as to maximum allowable limit, and as to location in the ingot, so a small discard will always remove it . . . . It would be desirable to make a somewhat comprehensive study of such matters as size and shape of ingot and other conditions influencing segregation.
>
> *Rolling.*—Our work so far does not show very definitely the influences of such matters as speed of rolling, number of passes in reducing from ingot to rail, temperature of rolling, distribution of rail sections, &c., but they indicate that such matters are of relatively small importance.
>
> *Conclusion.*—In conclusion, our work of the last nine months has shown fairly definitely that the matter of making safe rails, and in which the different rails of the lot will wear uniformly, is almost entirely a matter of making a good ingot free from excessive segregation, or of cropping off sufficient from the top to remove such excessive segregation.

Breaks Chiefly on Left-Hand Rails

In the discussion of the committee's report it was stated by C. E. Lindsay that a very large percentage of the breaks reported on the New York Central occur on the left-hand rail—as high as 90 per cent. in some months. Mr. Wickhorst referred in this connection to a report he had presented several years ago on the cause of breakages on the left-hand side. The reason he gave was that the locomotive is so built that when the counterbalance is down, giving the heaviest vertical load, the engine noses to the left at the same time. Mr. Wickhorst added that the preponderance of broken rails on the left-hand side applies to cross-sectional breaks or base breaks, and not to longitudinal breaks, such as split heads.

W. H. Elliott of the New York Central said that it had been shown some years ago in a discussion by the Master Mechanics' Association that the left forward driver of American locomotives is the heaviest of the four driving wheels, but there did not appear to be a difference in the blow delivered on the rail to account for such a great difference in the breakages between the left and right hand rails. R. N. Begien of the Baltimore & Ohio said that on the Chicago Division of that road practically 90 per cent. of breakages in the rail occur on the left-hand side. He suggested the use of a heavier rail on that side.

Union Steel Casting Company Equipment.—The Union Steel Casting Company, Pittsburgh, which proposes to build large additions, is asking for estimates on some of the equipment, including the following list of cranes: One 25-ton finishing crane, with 5-ton auxiliary lift, 68-ft. span; one 10-ton finishing crane, 68-ft. span; two 35-ton casting cranes, 10-ton auxiliary lift, 60-ft. span; one 10-ton casting crane, 60-ft. span; one 10-ton core crane, 34-ft. span; one 25-ton molding crane, with 5-ton auxiliary lift, 55-ft. span; three 10-ton molding cranes, 55-ft. span; one 10-ton dog crane, 32-ft. span; one 10-ft. yard crane, 30-ft. lift, 80-ft. span; one 20-ft. yard crane, 17-ft. span, 16-ft. lift, and one charging crane for the open hearth department. Deliveries are to be made during July.

Heavy snowstorms in Sweden have interfered with the usually regular shipments of iron ore from that country. Our recent importations have, therefore, been comparatively light, but one cargo having been received at Philadelphia the past month. Four cargoes, however, are now afloat, with 33,575 tons of ore consigned to eastern Pennsylvania furnaces.

The Production of Steel in 1910

The Largest Output Ever Attained

In last week's issue of *The Iron Age*, through the courtesy of James M. Swank, vice-president and general manager of the American Iron and Steel Association, Philadelphia, we were enabled to give the figures of the total production in 1910 of steel ingots and direct steel castings in the United States. These figures showed that the achievements of all previous years had been far surpassed. From the same source have come the details of the year's production, which are presented below:

The Total Production of Steel

The production of all kinds of steel ingots and castings in 1910 amounted to 26,094,919 tons, against 23,955,021 tons in 1909, an increase of 2,139,898 tons, or almost 9 per cent. Of the production in 1910 25,154,087 tons were ingots and 940,832 tons were castings, as compared with 23,298,779 tons of ingots and 656,242 tons of castings in 1909. The following table gives the production of all kinds of steel ingots and castings by processes in the last five years in gross tons:

Years. Gross tons.	Bessemer.	Open hearth.	Crucible and all other.	Total.
1910	9,412,772	16,504,509	177,638	26,094,919
1909	9,330,783	14,493,936	130,302	23,955,021
1908	6,116,755	7,836,729	69,763	14,023,247
1907	11,667,549	11,549,736	145,309	23,362,594
1906	12,275,830	10,980,413	141,893	23,398,136

The following table gives the production of all kinds of steel ingots and castings since 1906:

Years.—Gross tons.	Ingots.	Castings.	Total.
1910	25,154,087	940,832	26,094,919
1909	23,298,779	656,242	23,955,021
1908	13,677,027	346,220	14,023,247
1907	22,559,477	803,117	23,362,594
1906	22,624,431	773,705	23,398,136

Bessemer Steel Ingots and Castings

The production of Bessemer steel ingots and castings in 1910, all made by the acid process, was 9,412,772 tons, against 9,330,783 tons in 1909, an increase of 81,989 tons, or less than 1 per cent. The production in 1910 was 2,863,058 tons less than in 1906, when the maximum production of 12,275,830 tons was reached. Of the total production in 1910 9,355,350 tons were made by the standard Bessemer process, against 9,297,781 tons in 1909; 26,733 tons by the Tropenas process, against 15,506 tons in 1909; and 30,689 tons by other modifications of the Bessemer process, against 17,496 tons in 1909. The following table gives the production by States of Bessemer steel ingots and castings in the last four years:

States.	1907.	1908.	1909.	1910.
Ohio	3,636,679	1,955,446	3,466,077	3,314,053
Pennsylvania	4,351,841	2,106,382	2,845,602	2,975,750
Illinois	1,723,073	1,237,747	1,632,444	1,693,053
Other States	1,955,956	817,180	1,386,660	1,429,916
Totals	11,667,549	6,116,755	9,330,783	9,412,772

The following table gives separately by States the production of Bessemer steel ingots and castings in 1910. Of the total production only 923 tons were made by the standard process. By the Tropenas process the production of castings in 1910 was 26,723 tons and by the Bookwalter and other modified Bessemer processes it was 30,689 tons:

States.—Gross tons.	Ingots.	Castings.	Total.
Ohio	3,307,715	6,338	3,314,053
Pennsylvania	2,965,076	10,674	2,975,750
Illinois	1,684,263	8,790	1,693,053
Other States	1,397,383	32,533	1,429,916
Totals for 1910	9,354,437	58,335	9,412,772
Totals for 1909	9,296,969	33,814	9,330,783
Totals for 1908	6,096,196	20,559	6,116,755
Totals for 1907	11,634,276	33,273	11,667,549
Totals for 1906	12,243,229	32,601	12,275,830

Open Hearth Steel Ingots and Castings

The total production of open hearth steel ingots and direct castings in 1910 was 16,504,509 gross tons, against 14,493,936 tons in 1909, an increase of 2,010,573 tons, or over 13.8 per cent. Of the total production in 1910 15,641,158 tons were ingots and 863,351 tons were castings, as compared with 13,892,896 tons of ingots and 601,040 tons of castings in 1909 and 7,524,952 tons of ingots and 311,777 tons of castings in 1908. The following table gives the production of open hearth steel ingots and castings by States since 1907 in gross tons:

States.	1907.	1908.	1909.	1910.
New England	239,797	158,417	257,392	223,158
New York and New Jersey	706,019	350,348	618,117	713,245
Pennsylvania	7,868,353	5,322,229	9,400,287	10,153,816
Ohio	819,642	525,171	1,424,452	1,733,409
Indiana	181,662	167,299	783,957	1,307,129
Illinois	1,013,251	483,104	1,052,572	995,011
Other States	721,012	830,161	957,159	1,378,741
Totals	11,549,736	7,836,729	14,493,936	16,504,509

In 1910 there were 15,292,329 tons of open hearth steel made by the basic process and 1,212,180 tons by the acid process, while in 1909 the production by the basic process amounted to 13,417,472 tons and by the acid process to 1,076,464 tons. Of the total production of basic open hearth steel in 1910 14,858,353 tons were ingots and 433,976 tons were castings, while of the total production of acid open hearth steel in the same year 782,805 tons were ingots and 429,375 tons were castings. The following table gives the production of both basic and acid open hearth steel ingots and castings since 1907 in gross tons:

Years.	Basic open hearth steel.	Acid open hearth steel.	Total. Gross tons.
1910	15,292,329	1,212,180	16,504,509
1909	13,417,472	1,076,464	14,493,936
1908	7,140,425	696,304	7,836,729
1907	10,279,315	1,270,421	11,549,736
1906	9,658,760	1,321,653	10,980,413

The following table gives separately the production by States of open hearth steel ingots and castings in 1910. The increase in the production of ingots in 1910 as compared with 1909 amounted to 1,748,262 tons and the increase in the production of castings to 262,311 tons:

States.—Gross tons.	Ingots.	Castings.	Total.
New England, New York and New Jersey	825,595	110,808	936,403
Pennsylvania	9,825,920	327,896	10,153,816
Ohio	1,591,976	141,433	1,733,409
Indiana	1,278,571	28,558	1,307,129
Illinois	849,627	145,384	995,011
Other States	1,269,469	109,272	1,378,741
Totals for 1910	15,641,158	863,351	16,504,509
Totals for 1909	13,892,896	601,040	14,493,936
Totals for 1908	7,524,952	311,777	7,836,729
Totals for 1907	10,803,211	746,525	11,549,736
Totals for 1906	10,260,522	719,891	10,980,413

Crucible Steel Ingots and Castings

The production of crucible steel in 1910 amounted to 122,303 tons, against 107,355 tons in 1909, an increase of 14,948 tons, or over 13.9 per cent. The maximum production was reached in 1907, when 131,234 tons were made. The following table gives separately by States the production of crucible steel ingots and castings in 1910:

States.—Gross tons.	Ingots.	Castings.	Total.
Pennsylvania	69,656	2,158	71,814
Other States	38,015	12,474	50,489
Totals for 1910	107,671	14,632	122,303
Totals for 1909	94,672	12,683	107,355
Totals for 1908	55,360	8,271	63,631
Totals for 1907	121,001	10,233	131,234
Totals for 1906	117,170	10,343	127,513

Electric and Miscellaneous Steel Ingots and Castings

The production of steel in 1910 by various minor processes, including the electric process, amounted to 55,335 tons, against 22,947 tons in 1909, an increase of 32,388 tons. In 1908 the production amounted to 6132 tons, in 1907 to 14,075 tons, and in 1906 to 14,380 tons. Of the production in 1910 50,821 tons were ingots and 4514 tons were castings.

Included in the 55,335 tons of steel reported for 1910 are 52,141 tons of ingots and castings which were made with electricity by 7 plants in Massachusetts, New York, Pennsylvania, Indiana and Illinois, against 13,762 tons made by 4 plants in 1909 in New York, Pennsylvania and Illinois. In 1910 about 50,821 tons were ingots and about 1320 tons were castings, and in 1909 about 13,456 tons were ingots and about 306 tons were castings.

The Battleship Delaware Boiler Accident

The Finding of the Court of Inquiry

Through the courtesy of the Babcock & Wilcox Company, 85 Liberty street, New York, we are enabled to publish the subjoined summary of the finding of the Court of Inquiry which investigated the accident January 17, about 9:15 a.m., to one of the boilers of the battleship Delaware.

The accident occurred while the Delaware was bound for Norfolk, Va. The ship was proceeding under easy steam, but on account of poor draft the fire-rooms were closed and working under an air pressure of ¼ in. This, under the circumstances, was not more than good natural draft, so that the rate of combustion was about 18 lb. of coal per sq. ft. of grate. The boiler is one of the well-known Babcock & Wilcox marine type, with 4425 sq. ft. of heating surface and 103 sq. ft. of grate surface, there being 14 boilers in all. On trial, the Delaware developed nearly 30,000 hp., so that this boiler, when worked under forced draft, has a capacity of over 2000 hp.

It is interesting to note in this connection the statement of the commanding officer, made to the correspondents of the newspapers who boarded the ship upon her arrival at Hampton Roads. It appears that, although the captain was on deck at the time of the accident, he did not know that one had occurred until it was reported to him some minutes later. In other words, the explosion did not make sufficient noise to attract attention on the upper deck. The damage was confined to boiler O, and its extent and nature are set down in the findings in considerable detail. It is also to be noted that the structure of the vessel was not injured at all, thus emphasizing again the fact that an accident to a water tube boiler involves the minimum of damage. The boiler was repaired while at Norfolk with some new headers and new tubes, most of the work being done by the engineer department of the ship.

Following is the official statement made to the Babcock & Wilcox Company by R. S. Griffin, acting chief of the Bureau of Steam Engineering, Navy Department, Washington, D. C., under date of March 11:

In compliance with the request contained in your letter of February 24, and with the approval of the department, the bureau submits for your information the following general statement of the finding and opinion of the Court of Inquiry appointed to inquire into the accident to boiler O of the Delaware:

(a) An explosion occurred in boiler O January 17, 1911, by which three rear headers, Nos. 8, 9 and 10, were blown bodily out of the boiler.

(b) These headers were found severely bowed, their tube faces were bulged, and the metal showed signs of overheating. All the back headers of the outboard half of the boiler, 13 in number, were more or less bowed, the degree of distortion diminishing toward the outboard side of the boiler.

(c) The inboard half of the boiler was uninjured, and subsequent comment refers only to the outboard half.

(d) The 4-in. tubes next the fire were all more or less bowed near the back ends, and showed signs of having been burned; and the majority of the 2-in. tubes were more or less distorted, while a number showed signs of having been white hot.

(e) The front headers were in good condition.

(f) The superheater tubes and manifolds showed a red color, and the 4-in. tubes through the first and second passes showed the blue color characteristic of overheating.

(g) On two of the headers blown out were found scores and dents made by the headers striking obstructions. The character of the scores and dents and the blue color of the metal in the scores indicated that the metal of the blown-out headers was in a softened condition, due to heat, when they struck.

(h) The three headers showed unmistakable signs of having been very hot. They showed the characteristic blue color following overheating, and the tube face of each had been bulged out by internal pressure, possible only when the metal is heated to a condition approaching redness.

(i) The greatest heat appeared to have existed at about the width of the hight of the header, but the effects of overheating were manifest in all the back headers of the outboard half of the boiler, diminishing either way from the zone of greatest intensity of heat, which appeared to exist opposite the headers that were blown out.

(j) A number of 2-in. tubes of the blown-out headers gave evidence of having been white hot. The surface of these tubes, near the back ends, appeared burned, and was covered with a coating of black oxide of iron. Signs of overheating were also in the outboard half of the drum, from which much of the soot had been burned off.

(k) From a consideration of the preceding facts, the court concluded that the explosion was due to the lack of a sufficient quantity of water in the boiler, and that the water-tender on watch at the time was responsible for this condition. This opinion was strengthened by the fact that it was possible to enter the fire room with safety a very short time after the explosion occurred, which would not have been possible had the boiler contained the normal quantity of water.

(l) All testimony showed that the boiler was in good condition prior to the accident, and that the regulations regarding the care and preservation of boilers had been carried out; that other boilers which had been subjected to the same use were in good condition; and that the overheating noted in the injured boiler would have produced the results observed by the court after the accident, no matter how perfect the boiler.

(m) From some testimony before the court, the conclusion was reached that the reading of the water gauges was misleading, although the gauge glass fittings are recognized as simple and reliable; other testimony, however, led to the opinion that the opening of the feed check valve had been increased shortly before the accident occurred.

The Babcock & Wilcox Company adds: "There is one point in the finding which needs a few words of explanation to make it perfectly clear. The court finds that only the outboard half of the boiler was damaged. It might seem at first glance as though it would be impossible for one-half of the boiler to be injured and the other escape. The explanation, however, is very simple. The feed water enters the boiler in the steam and water drum, which is above the front headers and connected to them by nipples, and is discharged through an internal feed pipe perforated with holes on its lower side. This pipe extends from the check valve at the inboard end of the drum to a short distance past the center of its length. As long as the water in the drum was above the tops of the nipples mentioned, it would not of course make any difference where the feed water was introduced, as it would naturally find its level. In case of low water, however, due to inadequate feed, there might be, under moderate combustion, just enough water to save the inboard half of the boiler, where the water would go directly down the nipples, while only a few headers and associated tubes on the other side would get any. This appears to be the explanation of the salvation of the inboard side of the boiler. With this general statement of the surrounding conditions, we believe the finding of the court will be entirely clear, and it seems to us that the court is to be congratulated on the very careful analysis which it has made of all the circumstances of the case, so that the reasons for its conclusion that the accident was due to low water are perfectly evident and convincing."

The United States Metal Products Company

The John W. Rapp Company and the J. F. Blanchard Company, manufacturers of hollow metal and metal-covered doors, windows and trim, have combined under the name of the United States Metal Products Company and have established general offices and show room at 203-205 West Fortieth street, New York. The officers of the new company are John W. Rapp, president; C. F. Hale, A. C. Randall and A. J. Connell, vice-presidents; E. B. Wire, treasurer, and C. A. Leonardi, secretary. The factory of the John W. Rapp Company, College Point, Long Island, covering 7 acres, and that of the J. F. Blanchard Company, Long Island City, covering 5 acres, will be continued under the combined management. The main office on West Fortieth street will be devoted to sales offices and show room. It is a four-story structure, 37 x 72 ft. The ground floor is to be devoted to storage purposes and will house the company's delivery motor truck. The second floor will be used for show room purposes and for the executive offices. The third floor will be devoted to the sales, estimating and advertising departments, and the fourth floor to the engineering and drafting departments. The building is a fireproof structure and is equipped with a vacuum cleaning apparatus.

The Duplex Process at the Bethlehem Steel Company's Plant

A New Bessemer Department with Two 20-Ton Converters and a 400-Ton Mixer—Improvements at the Saucon Works

For the first time in some years Bessemer converters are now being operated at the works of the Bethlehem Steel Company, South Bethlehem, Pa. In the old days at Bethlehem, when Bessemer rails were rolled, there were five small Bessemer converters at the original or Lehigh plant. On the abandonment of the Bessemer process the converters were dismantled and their room is now devoted to other operations. Two 20-ton converters with accessories have been under construction at the Saucon plant in the past year and some details of this plant were given in *The Iron Age* of January 5. The new work at Saucon, together with the new construction at the Lehigh plant and the rearrangement required by the improvements, has involved an expenditure of about $6,000,000, while new construction still under way will represent $1,500,000 additional. The completion of this great programme of improvement will give the company an output of 75,000 tons of steel per month, of which 60,000 tons will come from the Saucon plant and 15,000 tons from the Lehigh plant.

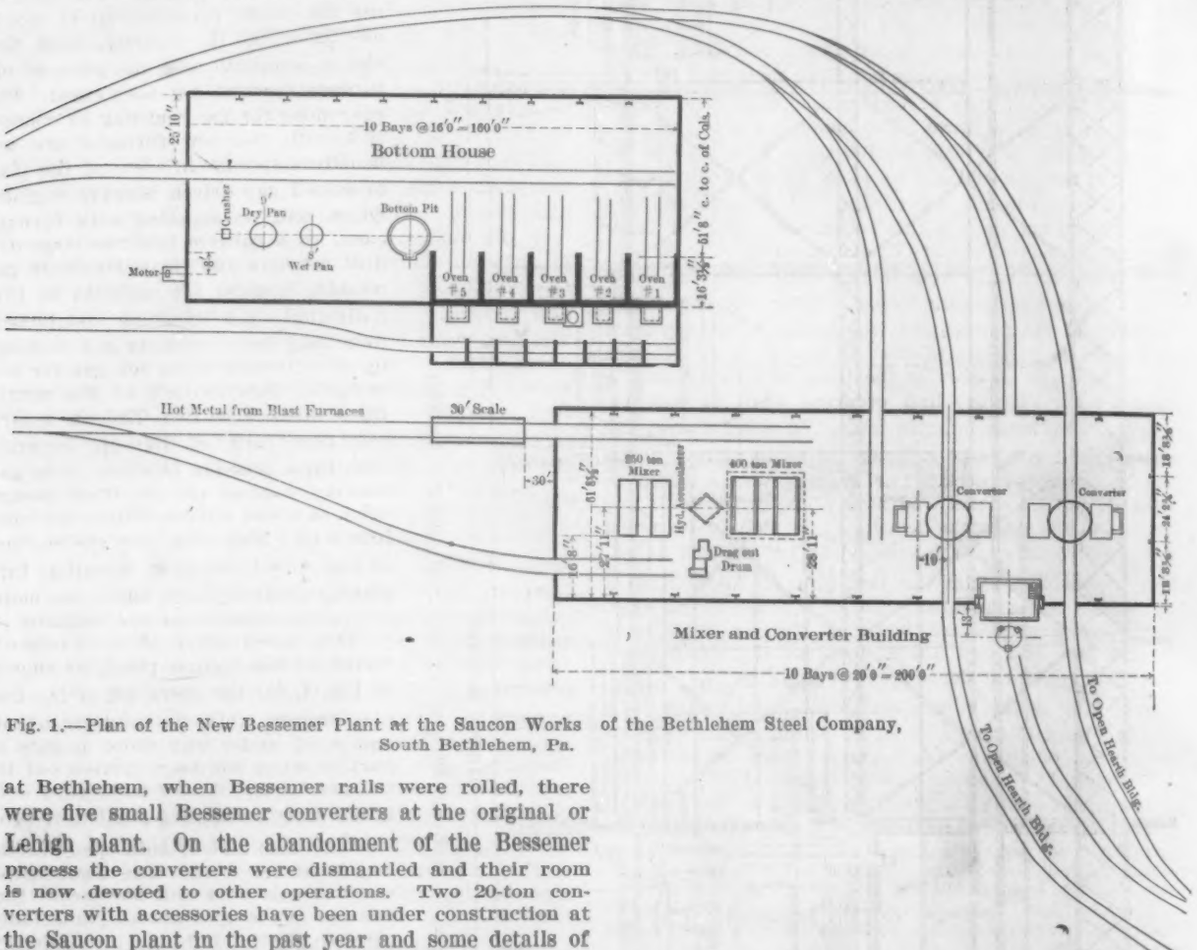


Fig. 1.—Plan of the New Bessemer Plant at the Saucon Works of the Bethlehem Steel Company, South Bethlehem, Pa.

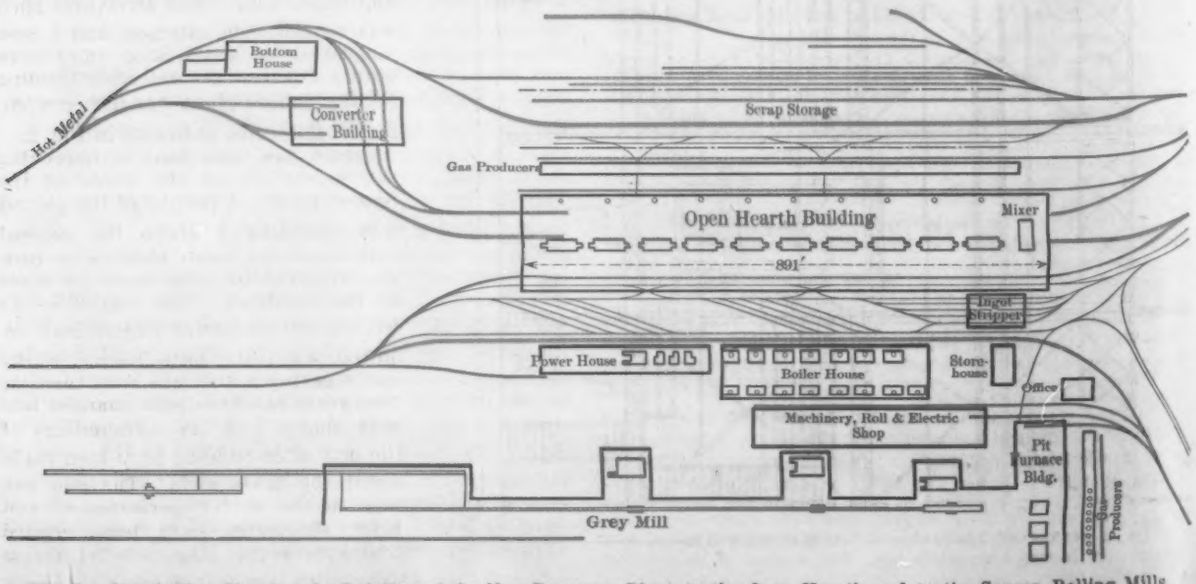
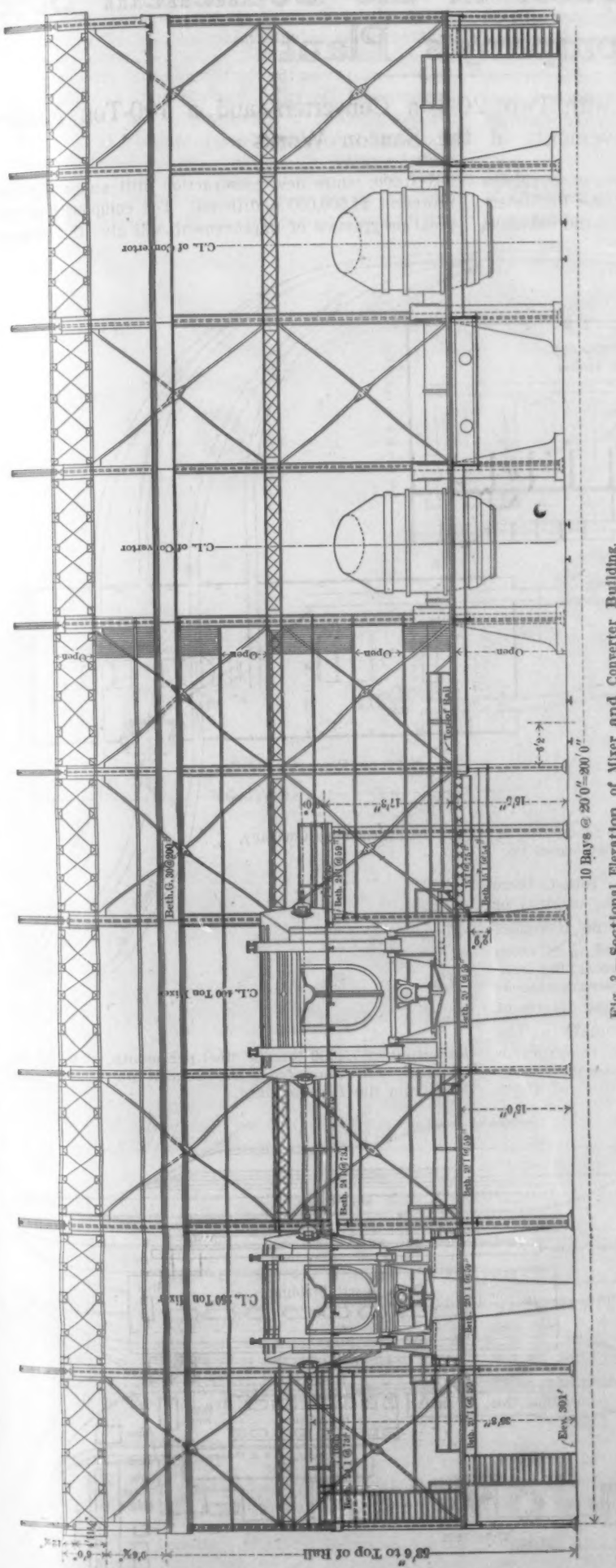


Fig. 2.—Sketch Plan Showing the Relation of the New Bessemer Plant to the Open Hearth and to the Saucon Rolling Mills.


C.L. of Converter
C.L. of Converter
Open
Open
Open
Open
Tool of Rail
Beth. G. 30 lb. 30'
Beth. 24 lb. G. 60'
Beth. 24 lb. G. 60'
Beth. 24 lb. G. 60'
C.L. 400 Ton Mixer
Beth. 24 lb. G. 60'
Beth. 30 lb. G. 60'
C.L. 250 Ton Mixer
Beth. 30 lb. G. 60'
Beth. 30 lb. G. 60'
Beth. 30 lb. G. 60'

No small part of the engineering work at the Saucon plant and at the ore end of the Lehigh plant in the past few years has been the extension and rearrangement of the track system. Including the tracks which will be built to connect the blast furnaces with the new coke plant of the Didier-March Company now under construction about one mile southeast of the Saucon works, or two miles from the blast furnaces, the Bethlehem Steel Company's track system will represent more than 80 miles.

Mixer and Converter Building

The new Bessemer plant is contained in the main in two buildings, one the mixer and converter building and the other the bottom house. The arrangements and dimensions are indicated in Fig. 1. The converter building is 200 ft. by 61 ft. 8½ in. It contains two 20-ton converters and a 400-ton mixer. Alongside the latter will be located later the 250-ton mixer now at one end of the open hearth building, as shown in Fig. 2.

The converters and 400-ton mixer were built by the Pennsylvania Engineering Works, New Castle, Pa. They are of the usual construction, with the exception that the mixer has a skin lining of chrome brick. Their relative positions are indicated in the sectional elevation in Fig. 3. The 400-ton mixer, of which details are given in Fig. 4, stands on concrete foundations. It is actuated by a hydraulic cylinder, as in Fig. 5. The line pressure in the building is 550 lb., and a tank accumulator is provided to balance the pressure. Double X piping is used throughout. Aiken standard valves are provided for operating the converters and mixer. For the tilting of the converters a vertical plunger is provided which actuates a rack in the usual way. Large margins of power have been provided in the cylinders for both mixer and converters. A four-girder crane of 60 tons capacity with a 20-ton auxiliary commands the mixer building. It was furnished by the Alliance Machine Company, Alliance, Ohio.

Hot metal from the blast furnaces at the Lehigh plant travels about 1½ miles over the route laid out to reach the mixer building. The incoming hot metal ladle cars pass over a 100-ton track scale furnished by the Standard Scale Company, Pittsburgh. The hot metal track in the mixer building is 301 ft. above the datum, this being also the level of the open hearth charging floor. The open hearth pouring floor level is 284 ft., while the general mill and yard level at the Saucon plant is 276 ft. The hot metal which comes in double trunnion ladle cars of 25, 35 and 40 tons capacity, is lifted by the 60-ton crane and the ladles are tipped from the rear by means of the hook on the 20-ton crane auxiliary. Fuel oil is used for heating the mixer. From the floor line of the mixer house to the mixer spout is 35 ft. 8 in., while the distance to the mixer floor level is 32 ft. 8 in. The top of the crane rail is 53 ft. 6 in. above the floor level.

For the transfer of mixer metal to the converter a wire rope haulage system is provided, and a 25-ton ladle car is used in this service. The driving mechanism consists of a 5-ft. drum and a 25-hp. Crocker-Wheeler motor, and the wire rope passes over a vertical sheave at either end of the building. The operator who controls the drag-out by means of levers is stationed on the mixer platform in front of the 400-ton mixer. The travel of the ladle car to the farther converter is 140 ft. A hydraulic

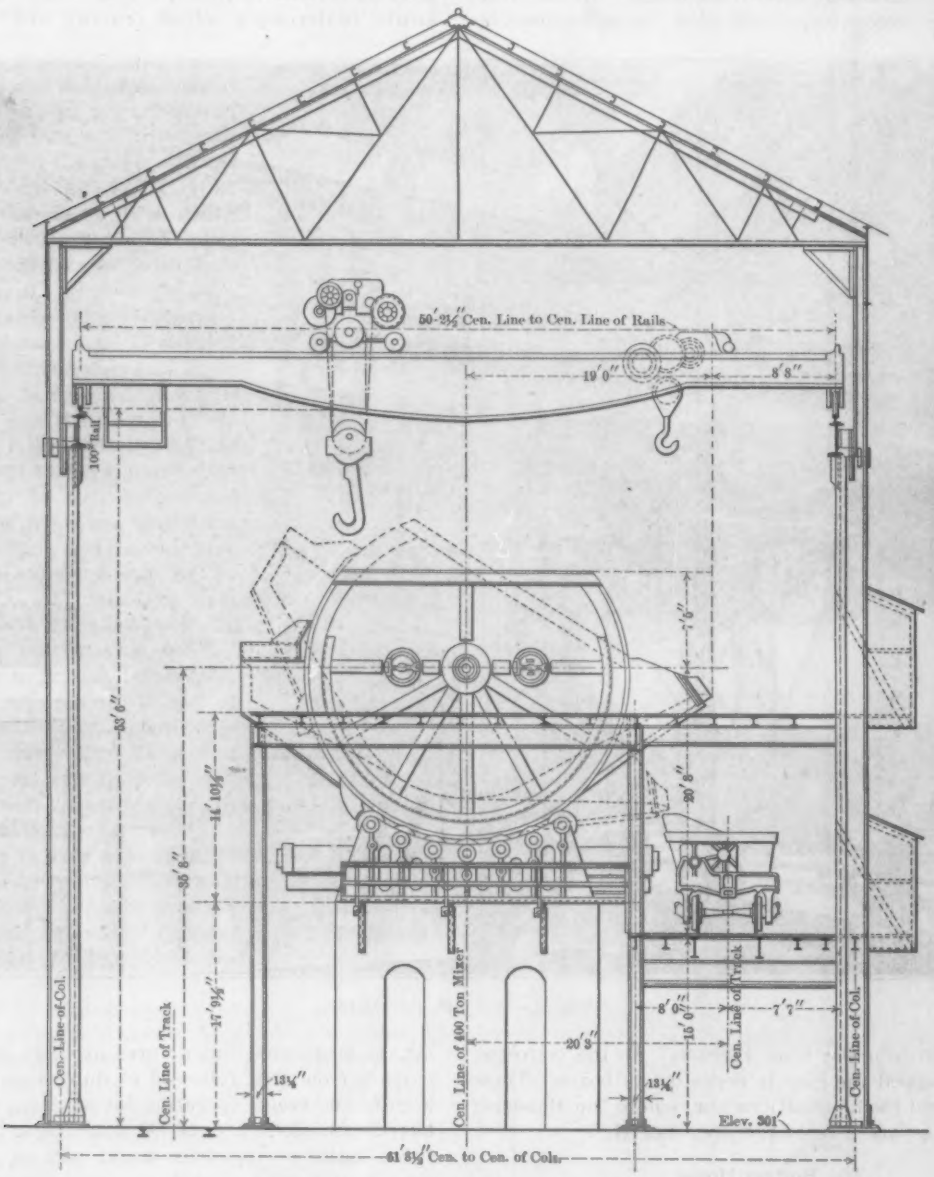


Fig. 4.—Section of Mixer Building Through the 400-Ton Mixer.

jib crane serves the converter, a rack and pinion being utilized for the operation of turning. Some idea of the large section of the converter is afforded by the fact that with a charge of 20 tons or more of metal the depth of bath is only about 18 in.

The converters are blown by a Southwark horizontal cross compound engine, with steam cylinders 46 and 84 x 60 in. and air cylinders 84 x 60 in. The engine is equipped with improved gridiron air valves, and is designed to furnish 45,000 cu. ft. of free air per minute at 30 lb. pressure. It is located in the power house adjacent to the open hearth plant, and the blast pipe to the converters is about 750 ft. in length.

All skulls from the Bessemer converters, as well as those from the open hearth department, are sent to a skull cracker convenient to both buildings. All slag from the Bessemer converter, being rich in manganese, is pumping station at the Lehigh River, and the exhaust water from the condenser equipment is therefore utilized in a return system, supplying in part the power for driving the centrifugal pumps.

Owing to the character of the formation underlying the new Bessemer buildings—limestone with clay pockets for the most part—the footings for the foundations of the mixers and converters were made unusually large and extended. Special provision had to be made also for the carrying off of all surface water in sewers.

Duplex Practice

Thus far the new Bessemer converters have been operated in connection with 5 of the 10 stationary open hearth furnaces, the remaining five making open hearth steel as heretofore from pig and scrap. Time will be required to develop a settled practice which will yield the

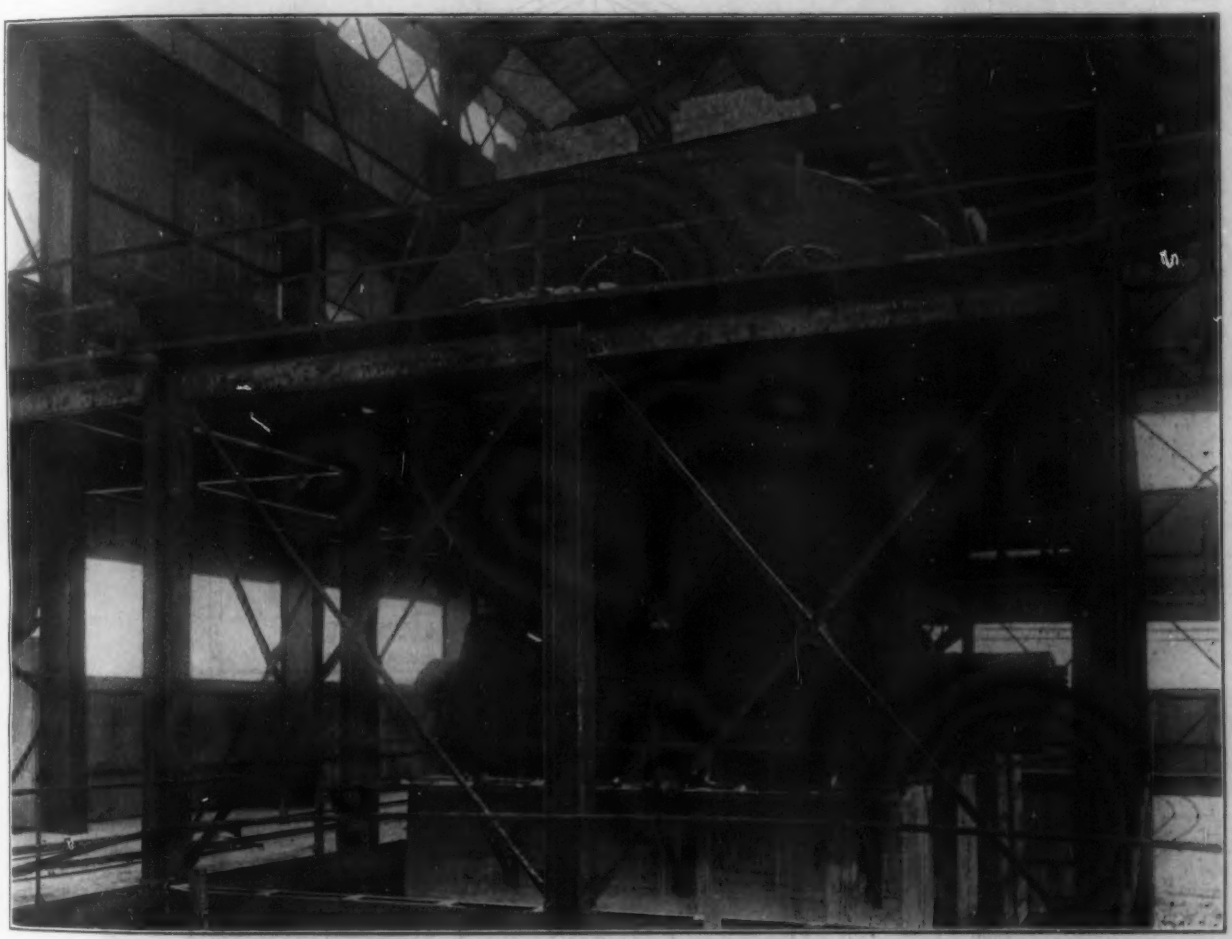


Fig. 5.—The 400-Ton Mixer.

charged again into the blast furnace. As the converter bottom is dropped the slag is deposited in boxes. These are transferred to the skull cracker, where the Bessemer slag is kept separate from the open hearth.

The Bottom House

The converter bottom house is 160 ft, by 51 ft. 8 in., with a lean-to, 16 ft. 3½ in., alongside the bottom ovens. There are five ovens, fired with small anthracite. A steam driven Eynon-Evans blower furnishes stack draft, steam being supplied by a 2-in. line front the open hearth boiler house. The ovens are equipped with Kinnear roller curtain doors. For handling the bottoms from the railroad track to the bottom pit and on and off the cars on which they are dried, a 20-ton crane is provided, furnished by the Northern Engineering Works, Detroit. The bottom house contains a Blake crusher for crushing stone for linings, and an 8-ft. wet pan and a 9-ft. dry pan of the Thos. Carlin's Sons Company type. The machinery is driven by a 100-hp. motor. There is also a compressor which supplies air for atomizing the fuel oil burned in the mixer. An adjacent storage house contains brick for ladle linings and converter bottoms.

The elevation of the Bessemer plant is 80 ft. above the

largest economies, but at present there is no special departure from that followed at duplex plants which have been in successful operation for several years. The open hearth furnaces are of 60 tons capacity. Ordinarily three ladles of converter metal will be charged for an open hearth heat, though at times the contents of four ladles may be used. The metal in the first two ladles is blown "dead soft" in the converter; the third ladle is given a shorter blow, retaining a portion of its carbon to facilitate the early reaction in the open hearth. Thus far the shortest heat in the open hearth, using blown metal, was one of 3½ hours. It is expected that ordinary practice will give five to six heats in 24 hours.

The basic pig iron made in the usual practice at South Bethlehem is nearer the ordinary merchant basic specification than that at the two plants which have made the most important contribution to duplex practice—those at Ensley, Ala., and Sydney, Nova Scotia. The pig iron from the Sydney blast furnaces runs not less than 1.50 per cent. in phoshorus and under the triplex process installed there in the past year, all metal passes through two open hearth furnaces with an intermediate blow in a basic Bessemer converter. At Ensley the silicon in the pig iron often runs considerably beyond 1

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per cent., and the acid Bessemer converter is used for silicon and carbon elimination. The Cuban ores used at Bethlehem from the company's own mines are low in phosphorus, and are used in part in making Bessemer pig iron for the company's ingot mold foundry and its acid open hearth department. The Adirondack and other Eastern ores which enter into the mixtures at the Lehigh plant are higher in phosphorus, and the resultant pig iron will often contain as high as 0.8 per cent. phosphorus.

The character of the ores was a minor consideration in determining the installation of the duplex system at the Saucon plant. The chief deciding factor was the independence thus to be secured from the scrap market. Operating five or more of its Saucon open hearth furnaces in connection with Bessemer converters, the Bethlehem Steel Company will make nearly sufficient scrap for its own needs. Considering that melting steel scrap has often gone as high as $5 a ton above the cost of making pig iron at South Bethlehem, the advantage of freedom from scrap market fluctuations can be appreciated. There are also to be considered the benefits of the increase in output and the larger leeway possible in blast furnace operation.

While details are not generally available as to the exact balance between the benefits of "duplexing" in the experience of the companies practicing it, and the interest and depreciation on Bessemer plant, together with loss of metal in converting, it is evident that it is sufficient to indicate the extension of the system. Where Bessemer plant is in existence, with the alternative of continually lessening employment and final abandonment, the economies of the duplex practice are naturally most pronounced.

The Triple Supply and Machinery Convention

A programme replete with interest to machinery and supply men has been arranged for the triple convention of the Southern Supply and Machinery Dealers' Association, the National Supply and Machinery Dealers' Association and the American Supply and Machinery Manufacturers' Association at Louisville, Ky., April 3, 4 and 5. The convention headquarters will be at the Seelbach Hotel.

On the first morning the associations named will hold joint opening exercises, when addresses of welcome will be made by Augustus E. Wilson, Governor of Kentucky; W. O. Head, Mayor of Louisville, and William Heyburn of Louisville. Responses will be made by Edward C. Hinman, ex-president of the Manufacturers' Association; H. C. Clark, president of the Southern Dealers' Association, and W. M. Pattison, president of the National Dealers' Association. The session will close with a general discussion on the "Business Outlook." In the afternoon of the same day the Southern dealers will organize their convention, and the following morning will listen to an address by E. Howard Smith, Superior Supply Company, on the "Proper Method of Compensating Traveling Salesmen," and a talk on the "Cost of Doing Business and the Proper Methods of Handling Expense Items," by W. P. Simpson, C. C. Pattison Company, Ltd., New Orleans, La. On Tuesday afternoon the members will have a "Question Box" discussion and will complete their separate sessions Wednesday morning.

The National Dealers will also organize their separate convention on Monday afternoon and will discuss "Resale Prices." On Tuesday there will be discussions on the "Cost of Doing Business" and "Manufacturers' Competitions." George T. McIntosh, Cleveland, who is secretary-treasurer of the One-Cent Letter Postage Association, will talk on "One-Cent Postage." In the afternoon the subjects of discussion will be "What Can Be Done with Illegitimate Competition?" and "Rebates for Decline in Price on Stock on Hand at Time of Decline." On Wednesday morning the association will discuss "Unintelligent Competition" and will elect its officers.

The Executive Committee of the Manufacturers' Association will meet on Monday afternoon and on Tuesday and Wednesday morning the members of the organization will discuss their side of the questions which are to come up before the two dealers' associations.

The three associations will hold a joint meeting on Wednesday afternoon. An excellent entertainment programme has also been arranged.

The Congress of Technology at Boston

The Congress of Technology with which the Massachusetts Institute of Technology will celebrate on April 10 and 11 the fiftieth anniversary of the granting of its charter, promises to be of unusual interest, not only as marking a period in the development of one of the world's greatest technical schools, but because it marks also the rise and high development of all that is now included under the names of "engineering" and "applied science." The sessions of the congress, all of which will be held in the buildings of the Institute of Technology, will open on Monday afternoon, April 10, with an address by President Maclaurin of the Institute in Huntington Hall; following this there will be read a few papers of special interest. On the second day both the morning and afternoon sessions will be devoted to the presentation of papers in the various buildings of the Institute. These sessions of the second day will be open to the public, as will also the laboratories and other departments of the institution. The evenings of both days will be devoted in large part to alumni functions. Monday evening there will be an alumni smoke in Symphony Hall; and on Tuesday evening, also at Symphony Hall, a banquet open to alumni and invited guests.

From the long list of papers which will be presented before the congress by distinguished alumni and members of the faculty of the Institute, the following are of special interest to our readers:

"An Object Lesson in Efficiency," by Wilfred Lewis, Tabor Mfg. Company, Philadelphia, Pa.

"Scientific Industrial Operation," by Tracy Lyon, Westinghouse Electric & Mfg. Company, Pittsburgh, Pa.

"Scientific Management," by David Van Alstyne, Allis-Chalmers Company, Milwaukee, Wis.

"Training of Industrial Foremen," by Charles F. Park, Associate Professor of Mechanical Engineering, Massachusetts Institute of Technology.

"The Responsibility of Manufacturers for the Training of Skilled Mechanics and Shop Foremen," by Arthur W. Williston, Wentworth Institute, Boston, Mass.

"Thirty Years' Work in Boiler Testing," by George H. Barrus, consulting engineer, Boston, Mass.

"Analysis of Some Losses of Efficiency in a Large Producer-Gas Engine Plant," by John G. Callan, electrical engineer, Arthur D. Little, Inc., Boston, Mass.

"Mechanical Handling of Materials," by Richard Devens, Brown Hoisting Machinery Company, New York City.

"Power Plant Betterment," by H. H. Hunt, Stone & Webster Management Association, Boston, Mass.

"Some Causes of Failures in Metals," by Henry Fay, Professor of Analytical Chemistry, Massachusetts Institute of Technology.

"The Conservation of Our Metal Resources," by Albert E. Greene, American Electric Smelting & Engineering Company, Chicago, Ill.

"The Technics of Iron and Steel," by Theodore W. Robinson, Illinois Steel Company, Chicago, Ill.

"Metallography and Its Industrial Importance," by Albert Sauveur, Professor of Metallurgy, Harvard University.

The American Manufacturers' Export Association, of which Henry T. Wills, 200 Fifth avenue, New York, is secretary, has issued a strong appeal for the support of manufacturers interested in export trade. This association already includes in its membership among the largest and most progressive manufacturers in this country. Mr. Wills states that some subjects are now being taken up, which will undoubtedly be beneficial to many members and to exporting manufacturers generally.

The Pittsburgh Gage & Supply Company, Pittsburgh, has received contracts for the installation of continuous oiling systems from the Republic Iron & Steel Company, Youngstown, Ohio, and the Johnette Foundry & Machine Company, Marianna, Pa. It has also secured a contract for installing a high pressure steam piping system at the blast furnaces of the Andrews & Hitchcock Iron Company, Youngstown, Ohio.

The McConway Car Wheel

The McConway & Torley Company, Pittsburgh, Pa., is manufacturing a new steel tired built-up type of wheel under patents granted to William McConway. This wheel is especially intended for railroad service and is designed to afford a simple and easily manufactured composite structure which will prevent any turning movement of the tire on the wheel center and resist the shocks and pounding incident to service without developing any looseness of parts.

The wheel consists of three parts—the wheel center, which is a steel casting; the cast iron hub and a rolled steel tire. No machine work is required on the tire except enough rough turning to make it true, and only a small amount of grinding and rough turning is necessary for the wheel centers. No bolts are used, and as the tire is neither fused nor shrunk on it cannot come off by reason of expansion and will not turn on the center. When it becomes necessary to separate the two members for renewing the tire, the tire is cut in two places, diametrically opposite, and falls apart, leaving the center ready for a new tire, which can be applied by unskilled labor and requires no special machinery. All that is needed in the way of machinery is a foundry cupola and lifting appliances of sufficient capacity to handle the car wheel. Fig. 1 illustrates the various stages in assembling the wheel, from the centering of the tire to the completed wheel, while Fig. 2 gives details of its construction.

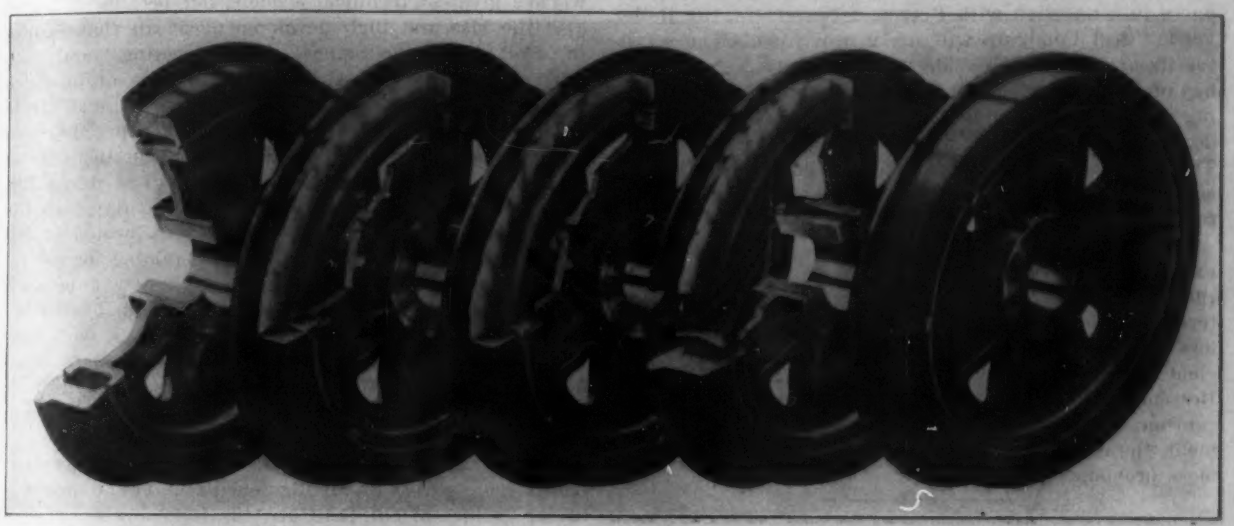


Fig. 1.—Views Showing the Successive Stages in Assembling the McConway Wheel Made by the McConway & Torley Company, Pittsburgh, Pa.

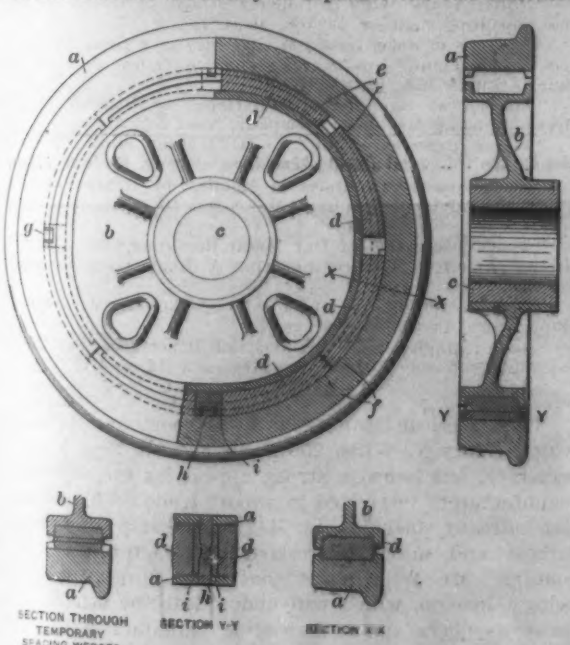


Fig. 2.—Details of the Wheel.

Referring to Fig. 2, *a* is the tire, *b* the wheel center and *c* the hub. Cast iron is employed for the hub, upon which the center plate is shrunk as a maximum of security and fit is obtained with the minimum pressure for application. Between the periphery of the wheel center and the inner circumference of the tire is an annular space, which is clearly shown at the extreme left of Fig. 1, where the parts are assembled. This space is divided into eight segments by the spacing wedges used for the temporary union of the tire to the center in assembling the wheel preparatory to casting the permanent locking wedges *d*, Fig. 2. The wedges are in pairs with the points opposed, and when the metal has cooled the shrinkage gives a clearance as in the pair shown at *e*. The view next to the left end of Fig. 1 shows the locking wedges in the first position and the temporary spacing wedges still in place. These are next removed and the locking wedges driven home. A view of the wheel after these two operations have been performed is shown at the middle of Fig. 1. This operation practically closes the space between the points of each pair of permanent locking wedges, as shown at *f*, Fig. 2. At these enlarged spaces are the sprag notches *g*, in the inner flanges of the tire, into which steel sprags, *h*, are fitted and the final closers *i* are cast in place. The wheel at this stage of its manufacture is shown in the fourth view in Fig. 1. The casting of the final closers completes the circle of locking wedges, which are under practically the same compression as if the tire was shrunk on. The sprags are imbedded in the circle of the cast iron wedges, and by engaging the tire through the notches in the flanges prevent the latter from turning. A view of the completed wheel is given at the right of Fig. 1.

The American Society of Mechanical Engineers will hold its monthly meeting on the evening of April 11 in the Engineering Societies Building, 29 West Thirty-ninth street, New York, when a paper will be presented on "The Economic Importance of the Farm Tractor," by L. W. Ellis, traction plow specialist for the M. Rumely Company, La Porte, Ind. It will be followed by a talk on "The Mechanical Equipment of Farm Tractors," by Dr. Charles E. Lucke, Professor of Mechanical Engineering of Columbia University, which will be illustrated by views taken at the Canadian Industrial Exhibition, held last summer in Winnipeg, Man.

The Duplex Metals Company, Chester, Pa., has made a reduction in the price of its copper-clad steel wire to 13 cents per pound base of 100 lb. or less, f.o.b. Chester, subject to discounts for cash and for quantity, making the net cash price 11.95 cents on 15,000 lb. and over. The cash discount is 3 per cent., 15 days. This is the lowest price the company has ever quoted.

The No. 3 Universal Boring Machine

A Larger Size with Several New Features

A new size of horizontal boring machine has been placed on the market by the Universal Boring Machine Company, Hudson, Mass. It is especially adapted for jig and crank case work and cylinder boring and is known as the No. 3 machine. While in many respects similar to the machine illustrated in *The Iron Age* September 2, 1909, it has a number of new features, among which are the location of the driving gear and the method of feeding the boring bar. It is of the constant speed drive type and may be either belt or motor driven. Its construction is very rigid; the upright supporting the spindle head is of box form, while the bed and the saddle are designed to provide abundant support for the table, which is an essential feature in a machine of its character often required to take heavy cuts. The bearing surfaces of the saddle on the bed are large. The operating levers and the hand wheel for the rapid adjustment of the boring bar and the facilities for changing the speeds and feeds are also noteworthy features. Fig. 1 is a front view of the machine, Fig. 2 shows the exterior of the head and Fig. 3 is an end view showing details of the drive. Fig. 4 gives details of the head construction, while Fig. 5 shows the method of transmitting the automatic feed to the table.

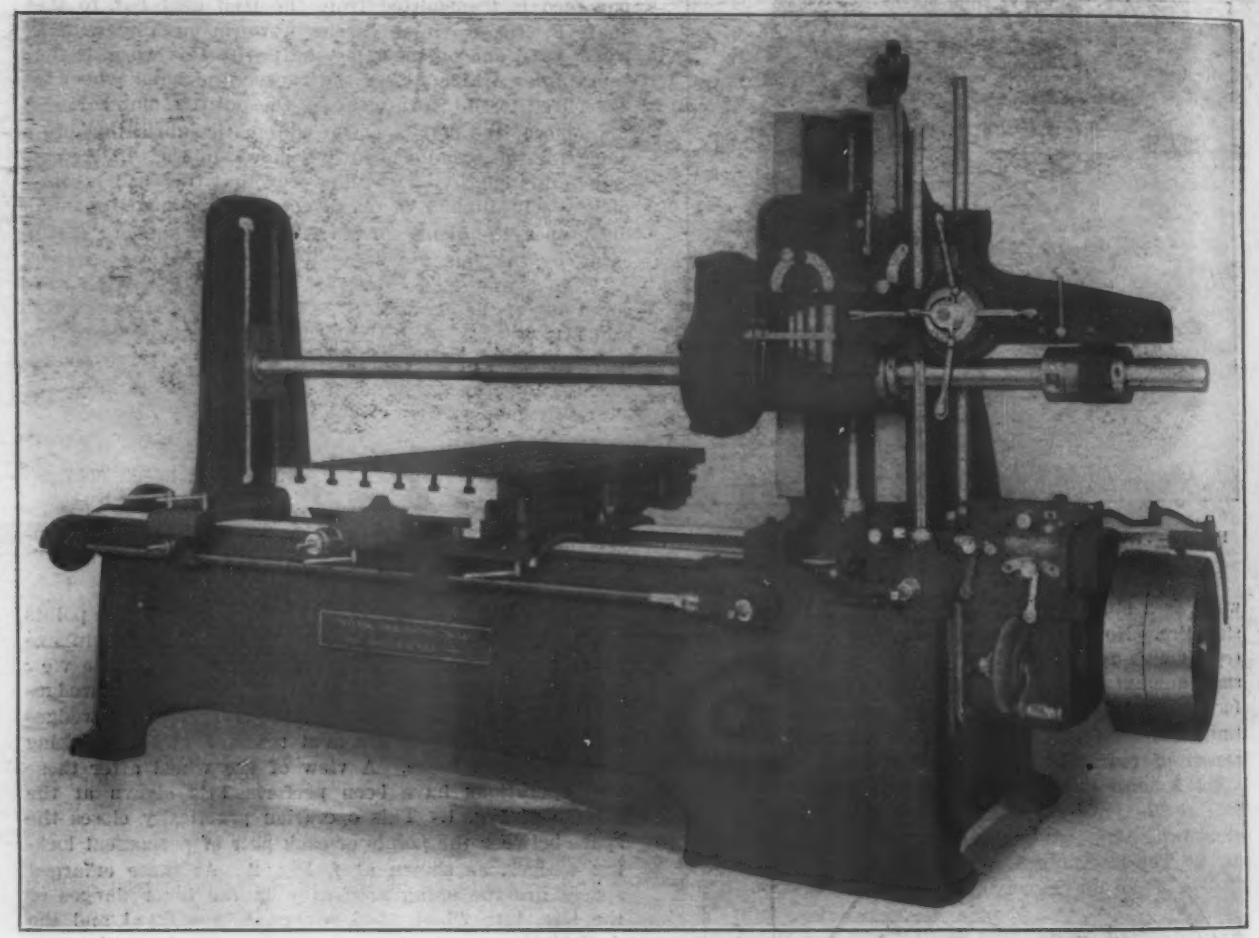


Fig. 1.—Front View of the No. 3 Horizontal Boring Machine Built by the Universal Boring Machine Company, Hudson, Mass.

The Spindle Drive

As the drive is from a single step pulley and a loose pulley is provided on the machine itself, the machine can be driven directly from the main line shaft. A powerful drive is secured by using a driving pulley 18 in. in diameter and 3½ in. wide, running at a speed of 250 rev. per min. The loose pulley A, Fig. 3, is in one piece and has an oil reservoir for supplying the bearing cast in the hub. In a groove in the bearing proper is a wick, which dips into the oil reservoir. For shifting the driving belt from the loose to the tight pulley, a handle is conveniently located at B. The speed gear box transmits the drive to the spindle through the vertical shaft E to the head, exterior and interior details of which are shown in Figs. 2 and 4, respectively. The head casting

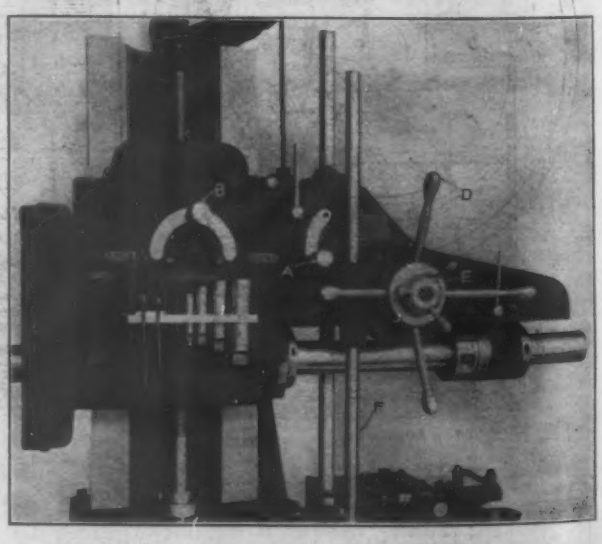


Fig. 2.—Exterior View of the Head.

is in one piece, with oil pockets and half of the gear casing formed in the casting itself to retain the supply of lubricant, an arrangement radically different from that in the No. 2½ machine.

The various operating handles are shown in Fig. 2

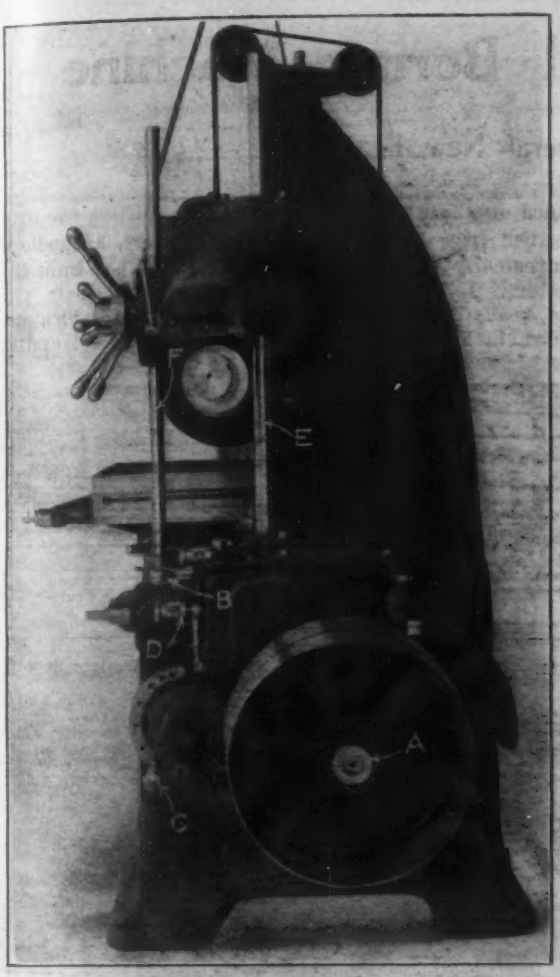


Fig. 3.—An End View, Showing Details of the Drive.

The handle A reverses the direction of the spindle rotation by operating the jaw clutch *k*, Fig. 4. The clutch *o*, operated by the handle B, Fig. 2, changes the machine from direct geared to back geared drive. As can be seen in Fig. 4, the power is transmitted from the speed gear box through the shaft E, Fig. 3, to a spur gear, which is not shown, and then through *g*, Fig. 4, to the bevel gear *h*. The last named, with the gears *i* and *j* and the clutch *k*, make up the reversing mechanism, from which the power is transmitted direct to the driving gear *q* when the clutch *o* is engaged with *l* or through the gears *m* and *n* when the clutch is engaged with the gear *h*. The driving gear *q* and driving pinion *r* are placed close to the working point, which relieves the spindle from practically all torsional strains and secures stiffness when large milling cutters are used, eliminating the chatter usually attending the taking heavy cuts when the drive is more remotely applied. The gear *q* has a long hub which forms the spindle, and two keys, *v* and *w*, fastened to it, drive the boring bar. This driving gear hub also forms a face plate, and has four drilled and tapped holes for holding a face milling cutter.

The head casting is designed to permit the rack *s*, which moves the spindle longitudinally, to travel the full length of the head, and thus the hand wheel for controlling the quick movement of the bar can be placed on the head close to the face of the spindle. This enables the operator to see the boring cutters while making adjustments. A horizontal travel of 30 in. is obtained at one setting of the adjustable collar *t*. The automatic bar feed is transmitted from the feed gear box to the shaft F, Fig. 2, which carries a worm meshing with a worm gear, and on the same shaft with this worm is the spur pinion which drives the rack. The hand wheel D is secured to the worm gear by the positive clutch E.

Some of the details of the automatic lubrication provided for the spindle head are shown in Fig. 4. Referring to this engraving it will be seen that the head is completely self-oiling. An oil reservoir surrounds the spindle proper, the gears run in a bath of oil and are lubricated by the splash system, while the oil reservoirs *u*, *x*, *y*, *z*, *a'* and *b'*, Fig. 4, for the various bearings are cored out of the casting. The lubricant is fed by a wick laid in a slot milled in the bearing, the ends of the wick dipping into the reservoir underneath. The large reservoir for lubricating the main spindle bearing is filled at *b'* and drained at the bottom.

Speed and Feed Changes

The gear box containing the feed and speed change gears is strong and compact. The oil bath in which these gears run keeps them lubricated, insuring quiet running and long life. This gear box provides eight speed changes through the levers C and D, Fig. 2, and the back gear lever doubles this number at the head. The total speed range is from 15 to 200 rev. per min. The head has nine feed changes in either direction, ranging from ¾ to 5½ in. per minute independent of the spindle speed. One lever controls the stopping, starting and reversing of the feeds. This system of feed drive provides finer feeds for the small cutters at high rotative speeds and coarser feeds for the larger ones where the speed is low than it is possible to obtain where the feed is driven from the spindle and at the same time fewer speed changes are required.

The transmission of the automatic table feed is revealed in Fig. 5, where the table has been removed from the saddle to show the details of the feed. From the feed gear box power is transmitted through the shaft X, which has a 45-degree spiral gear mounted upon it. This gear meshes with the 45-degree spiral gear W, which runs free on the shaft X until it is engaged by a sliding jaw clutch splined to the shaft. The spiral gear

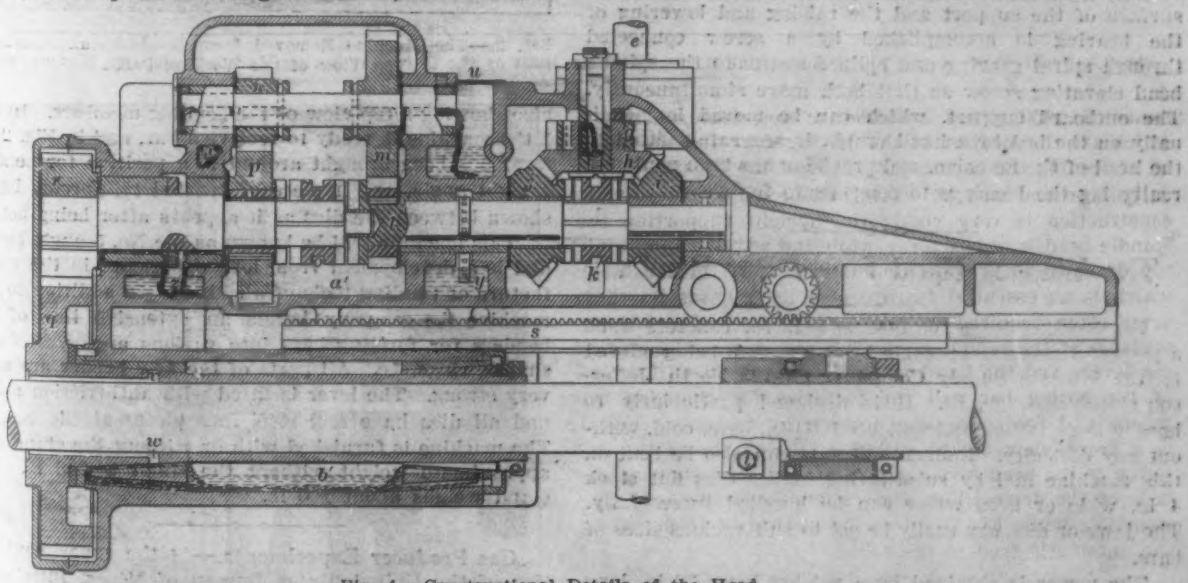


Fig. 4.—Constructional Details of the Head.

W carries the nut which operates the table feed. When the lever at the right of the saddle is pulled out, as shown in the engraving, the teeth of the sliding jaw clutch engage corresponding teeth on the hub of the spiral gear underneath the saddle and the feed is put in action. For throwing out the cross feed automatically the stop Z is provided. A nut, Y, secured to the saddle enables the saddle and the table to travel either by hand or power longitudinally along the bed of the machine. In addition to the automatic feed, hand crank feed with micrometer adjustment is furnished for the cross and the longitudinal movements of the table.

The boring bar which is 3 in. in diameter has a vertical feed of 30 in. and a horizontal travel of the same length. These feeds and a vertical milling feed and quick raising and lowering feed for the head and the cross and longitudinal feeds for the table are all automatic and reversible. The bearing for the outboard

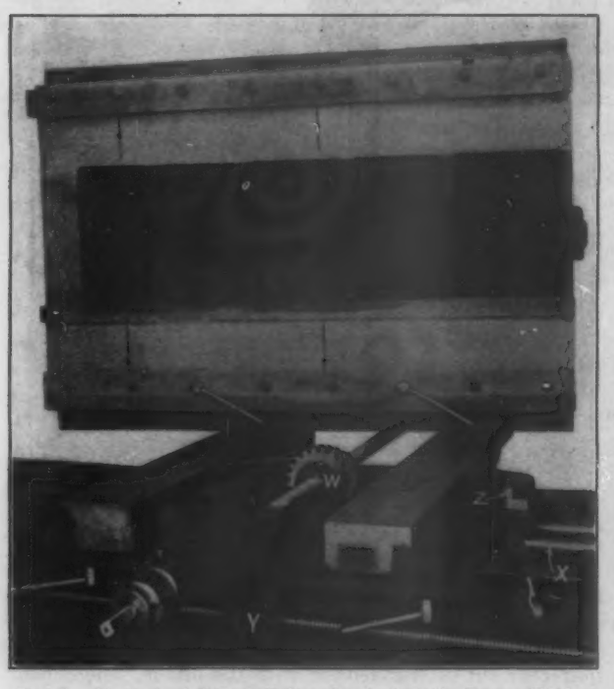


Fig. 5.—Method of Transmitting the Automatic Power Feed to the Table.

boring bar support is gibbed to the internal guiding surface of the support and the raising and lowering of the bearing is accomplished by a screw connected through spiral gearing and splined shafts to the spindle head elevating screw so that both move simultaneously. The outboard support, which can be moved longitudinally on the bed by a hand crank, is accurately fitted to the head of the machine, and provision has been made for realigning the bearings to compensate for wear.

The Wallace Hand Power Bar Bender

For bending large reinforcing bars for concrete work a powerful machine operable by one man is being offered by the Wallace Supply Company, 108-128 North Jefferson street, Chicago, Ill. It is designed particularly to handle heavy stock and will bend 1¼-in. bars, cold, without any difficulty. Rounds and flats can also be bent on this machine and by substituting higher dies flat stock 4 in. wide or even wider can be handled successfully. The jaws or dies can easily be set to suit various sizes of bars.

The power is obtained by a ratchet lever 36 in. long which operates a small pinion engaging a stationary segment gear that forms part of the machine. Thus the radial member carrying the bending jaws is turned through a sufficient angle to produce the required bend. Fig. 1 shows the machine set up complete on a cast iron stand ready for operation, and Fig. 2, the working parts removed from the stand and stood up against it, giving an idea of how it may be compacted for transporting and

Fig. 1.—The No. 5 Angle Bender Made by the Wallace Supply Company, Chicago, Ill.

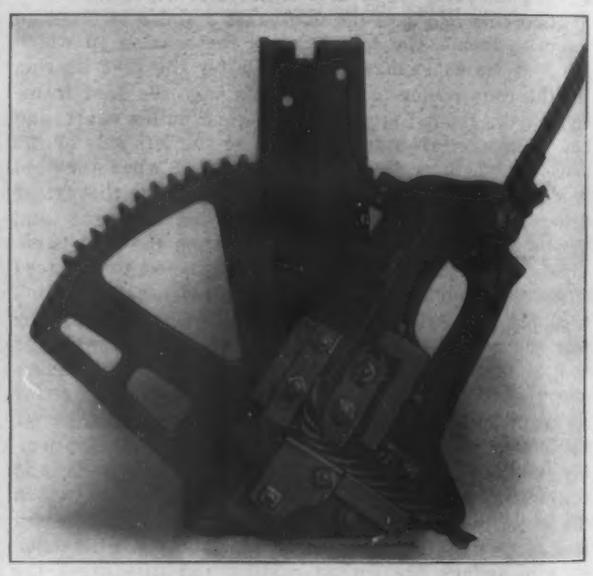


Fig. 2.—The Machine Removed from Its Pedestal, Showing a Top View of the Working Parts.

also showing a top view of the bending members. In Fig. 1 the machine is ready to receive a bar, and in Fig. 2 the lever has been brought around to a position for bending a right angle, and a piece of twisted reinforcing bar is shown between the dies as it appears after being bent.

This machine will be known as the No. 5 angle bender and is a development from long experience in the manufacture of bending tools of all kinds. In addition to this machine the company builds an extensive line of bar benders for forming bars into various angles, hooks, U shapes, rings, &c. All parts of the new bender are made very strong. The lever is fitted with anti-friction rollers and all dies have tool steel face plates at the corners. The machine is furnished with or without the stand. Its approximate weight without the stand is 268 lb. The stand weighs about 160 lb.

Gas Producer Experiments.—At the experiment station of the United States Bureau of Mines, Pittsburgh, Pa., several trial runs have been made with an experimental gas producer, using coke as fuel, with which limestone has been mixed in varying proportions, the purpose being to flux the ash and form a liquid slag, thus avoiding clinker and ash troubles and consequent shutdowns. Liquid slag has been readily made which runs freely from the producer. The high temperatures necessary are very efficient in the generation of gas.

A New Rockford 14-In. Drill

Equipped with a Special Feed, Combining Lever, Hand Worm and Belt Feeds

The Rockford Drilling Machine Company, Rockford, Ill., has developed a new 14-in. drill equipped with a special type of feed. Convenience and simplicity in handling the feed on a sensitive drill are two special features of the design. A view of the drill is given in Fig. 1, while Fig. 2 shows the details of the feed mechanism.

This feed consists of a three-step cone pulley on the upper shaft and a lower feed cone pulley placed on the same level as the worm shaft. In this way it is possible to secure three different feeds from the cone pulley on the upper shaft, and by placing the lower cone pulley on the same level as the worm shaft, the necessity of using bevel gears to change the direction of the feed is avoided and a steel spur pinion and gear protected by a guard can be used instead. The lower feed cone pulley is placed in the lowest possible position, so as to employ a very long feed belt, thus increasing the frictional pull. The feed frame is in one piece and swings on a long hinged pin, *l*, Fig. 2, which is held by a lug cast solid to the main frame of the machine. For stopping and starting the feed, the lever *h* is lifted or depressed.

Referring to Fig. 2 the two boxes *a* and *b* are cast on the main frame, the former being the bearing on which the feed frame swings, and the latter the rear bearing for the cone pulley shaft. In this way the feed frame acts as the front bearing for the cone pulley shaft, and has an arm, *c*, extending through to the left side of the machine, which engages a forked casting when the feed is engaged. The coiled spring *d*, Fig. 2, pulls this frame down and also pulls up on the forked casting *e* and throws the step *n* under the arm *c* when the feed is engaged. There is a link, *f*, which is pinned to the feed frame and hangs under the starting lever *h*. This link is simply used for pulling in the feed. On the top of the rear end of the starting lever is a bent dog, *g*, which is used in connection with the former when it becomes necessary to disengage the feed quickly. A cast iron collar on the left of the cross spindle is threaded and carries the loosely fitting nut *i*, having a short radially projecting arm. This nut revolves with the cross spindle and travels out until it strikes the adjusting screw *m*, which can be set to trip the feed at any desired point. The nut then locks and turns with the cross spindle, whereupon its arm swings the forked casting and disengages the step *n*, which holds the arm *c* of the feed frame. The coiled spring then pulls the worm *j* and the worm wheel *k* apart, by rocking the feed frame on the pin *l*. The starting lever fits loosely on the back pin. To secure hand worm feed the handle *p* is shifted to move the large spur gear out of engagement with the pinion, whereupon the hand wheel *o* can be used to turn the worm, and feed the spindle through the worm wheel.

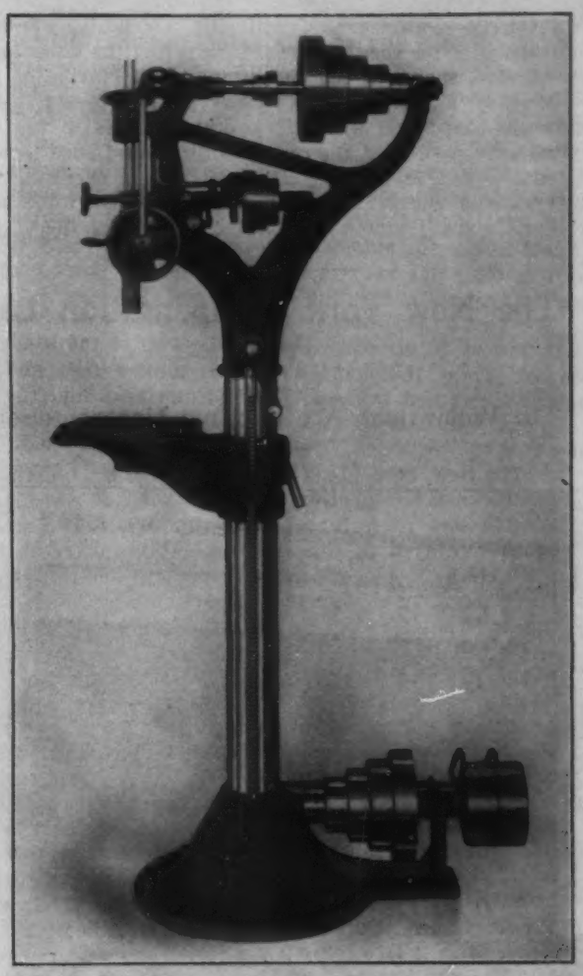


Fig. 1.—The New 14-In. Drill Built by the Rockford Drilling Machine Company, Rockford, Ill.

An automatic stop enables the full travel of the spindle sleeve to be secured. This is not shown in Fig. 1, as it is on the opposite side of the machine. In place of the former hand lever feed, a lever on the right side of the machine held by a suitable spring is used. This

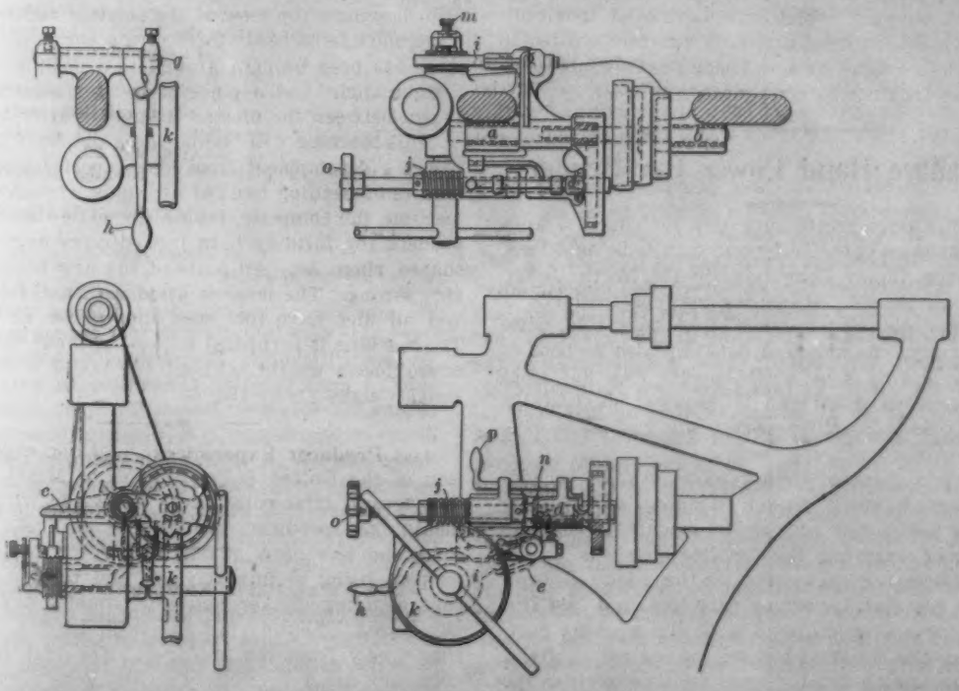


Fig. 2.—Details of the Feed Mechanism.

lever can be adjusted longitudinally, which makes it very convenient for small drilling. For facing the small hand wheel *o*, shown at the end of the shaft bearing of the worm in Fig. 2, is used. This wheel is attached to the worm shaft, and when the operator wishes to use the machine for facing, the conveniently located push lever *p* enables him to disconnect the spur pinion operating the feed, and engage the worm with the worm wheel and use the small hand wheel for the facing operations.

The New York Compensation Law Void

The Wainwright Act Declared Unconstitutional

The New York Court of Appeals, March 24, declared the workmen's compulsory compensation law, which was enacted last year, to be unconstitutional. The whole bench concurred in this decision. It is held that the act takes an employer's property without due process of law. According to lawyers who have studied the opinion, the decision in no way affects the employers' liability law, which was amended at the same time the Wainwright act was passed, and which vastly increases the liability of the employer by striking out the ordinary defenses in negligence suits under the old common law. The New York *Evening Sun* presents the following excellent article on this subject:

"The workmen's compulsory compensation law which the Court of Appeals has by a unanimous vote held to be unconstitutional sought to do much more than correct specific hardships of the common law rules of employers' liability. It was a frank attempt to make certain employers insure their employees against injury in the course of their labor.

"The employments thus singled out as dangerous were the following: 1. The erection or demolition of any bridge or building in which iron or steel framework is involved; 2. The operation of elevators, derricks, or hoisting apparatus used in or on such bridge or building; 3. Work on scaffolds; 4. Construction of tunnels and subways; 5. All work carried on under compressed air; 6. Construction or operation and repair of electrical wires or apparatus; 7. All work necessitating proximity to gunpowder, blasting powder or dynamite; 8. The operation of locomotives, motors or cars propelled by steam, electricity or gravity and the construction or repair of railroad tracks. Employers in these lines of work were rendered liable to compensate their employees for all accidents due to "the negligence of employers, agents or employees, or by the necessary risk or danger of the employment or one inherent in the nature thereof." Death compensation was fixed at four years' wages, but not to exceed $3000; and the compensation for total or partial disability was fixed at 50 per cent. of the average weekly wage, but not to exceed $10 a week, for a period of not more than eight years.

"It will be seen that these provisions sought practically to eliminate all question of negligence either on the part of the employer or of the employee. Under them, a plaintiff need not prove that his injuries were the result of any fault of the employer; and the employer could not set up as a defense the fact that the plaintiff had been grossly negligent. Thus in the important case now determined, the plaintiff, Ives, a switchman in the employ of the South Buffalo Crosstown Railroad Company, merely set up his complaint that he had been injured through a necessary risk or danger of his employment and asked for recovery under the statute therefor. In short, a revolutionary overturning of the theory of liability in such cases was attempted; liability was henceforth to attach regardless of sins of omission or commission and by a purely arbitrary fiat of the State.

"It was this change wrought by the Wainwright act which came before the Court of Appeals in the present case and has now been declared unconstitutional for reasons which were well summed up by Judge Werner in this sentence of his opinion:

If such economic and sociological arguments as are here advanced in support of this statute can be allowed to subvert the fundamental idea of property, then there is no private right entirely safe, because there is no limitation upon the absolute discussion of legislatures and the guarantees of the Constitution are a mere waste of words.

"As to the so-called employers' liability law, however, the court intimates a more favorable attitude. To be sure, the views expressed thereon are all *obiter dicta*, but as an indication of the standpoint of the court they are of much interest. These other new provisions are applicable to all employments and are designed to modify certain rules of liability which often work hardship upon plaintiffs. The 'assumption of risk' rule is materially modified, the burden of proving contributing negligence is placed upon the employer, and the scope of the 'fellow servant' rule is considerably narrowed. As we understand the opinion of the Court of Appeals, these modifications of the existing law are likely to be viewed with favor. Certainly there is every ground in reason for distinguishing them from the revolutionary change proposed by the Wainwright act."

The Foundrymen's Convention at Pittsburgh

Preliminary announcement is made of the outline programme for the convention of the allied foundrymen's associations at the Exhibition Building, Duquesne Way, Pittsburgh, May 22 to 26, 1911. The following is the general arrangement of sessions with a tentative indication of the papers that will be discussed:

TUESDAY, MAY 23.

9 a.m.—Registration.

10 a.m.—Joint Session. Addresses of welcome. Papers on "Production Cost," "Economic Foundry Insurance," "Uniform Contracts."

2 p.m.—Separate Sessions. A. F. A.: Papers on "Unloading Methods," "Use of Borings in Cupolas," "Effect of Alloys in Cast Iron," "Permanent Molds." A. B. F. A.: Papers on "Vanadium in Nonferrous Alloys," "Determination of Nickel in Bronzes," "Pouring High Grade Bronzes."

7 p.m.—Foundry & Machine Exhibition Company. Exhibit. Open throughout the week during the day, and Saturday evening, May 27.

WEDNESDAY, MAY 24.

9.30 a.m.—Joint Session. Papers on "Rotary Blowers," "Foundry Construction," "Heating and Lighting Systems," "Patternmaking," "Molding Machines."

2 p.m.—A. F. A. Session. Papers on "Acid and Basic Open Hearth Processes," "Electric and Converter Furnaces for Steel Castings," "Effect of Vanadium and Titanium on Steel." A. B. F. A. Session. Papers on "Corrosion of Brass Foundry Products," "Pyrometer and the Aluminum Foundry," "Nonferrous Foundry Economies," "Equilibrium Diagrams."

2 p.m.—Individual plant visitation.

6.30 p.m.—Dinner. Pittsburgh and Associated Foundry Foremen.

THURSDAY, MAY 25.

9.30 a.m.—Joint Session. Papers on "Molding Sand," "Use of Alloys," "Shot in Castings."

1 p.m.—Train excursion to foundries and steel works. (Pennsylvania-Union Station.)

8 p.m.—Entertainment by Foundry & Machine Exhibition Company to members of all associations and their guests attending the conventions.

FRIDAY, MAY 26.

9.30 a.m.—Separate Sessions. Election of officers and reading of papers.

3.30 p.m.—Pittsburgh and Cincinnati ball game at the Forbes Field.

6.30 p.m.—Subscription dinner open to all who attend the convention or exhibition.

SATURDAY, MAY 27.

The exhibition of the Foundry & Machine Exhibition Company will be open throughout the day and evening.

The Pittsburgh Foundrymen's Association has appointed an Executive Committee to handle convention affairs, as follows: Joseph T. Speer, chairman; F. H. Zimmers, secretary; J. S. Seaman, finance; H. E. Field, convention; W. A. Bole, plant visitation; Eliot A. Kebler, reception; G. P. Bassett, Jr., ladies' entertainment; E. D. Frohman, ball game; W. B. Robinson, press.

The Natural Gas Engineering Company, Pittsburgh, has been organized and has opened offices at 801 Machesney Building, for the purpose of selling gas burners, compressors, fittings, &c., and will represent the Reinforced Brazing & Machine Company, Pittsburgh.

The Keystone Bronze Company Expanding

John S. Craig, secretary and treasurer of the above named company, whose general offices are on Thirty-ninth street, near the Allegheny Valley Railroad, Pittsburgh, states that it has taken over the brass, bronze and copper business of the Brighton Brass & Bronze Company, New Brighton, Pa., and the bronze and copper department formerly operated by the Best Mfg. Company, Pittsburgh, and will continue to operate its own plant at Thirty-eighth and Thirty-ninth streets. The company is therefore in a good position to produce in large quantities copper, bronze and aluminum castings, babbitt metals, blast furnace tuyeres, coolers, bosh plates, locomotive driving boxes, roller mill bearings and any other specialties made in these metals. It is also the sole manufacturer of Keystone valves, acid proof metal, Knox patent copper water-cooled open hearth furnace doors, frames, rims, ports, &c., of which many have been installed in different plants of the United States Steel Corporation and of independent companies. Copper jackets for copper smelters and machinery builders' castings will also be produced. The president of the company is Mont. Murray; vice-presidents, George Best and W. H. Schoen.

The bi-monthly adjustment of the puddling and finishing scale recently made at Pittsburgh, based on the average price on shipments of iron bars for January and February at about 1.30 cents, fixes the puddling rate for March and April at $5.75 a ton, against $5.87½ in January and February. Wages for finishing mills for March and April will be reduced 1 per cent. as compared with the two previous months.

The New Newton Cold Saw

An Annular Disk Blade with Internal Teeth

A new design of sawing machine has been placed on the market by the Newton Machine Tool Works, Inc., Twenty-fourth and Vine streets, Philadelphia, Pa. Its special features are the locating of the teeth of the saw blade on the inner periphery of an annular disk as contrasted with the ordinary type of blade having the teeth on the outside, giving a concave instead of a convex cutting track, and the use of a positive direct gear drive. Figs. 1 and 2 show the driving and the operating sides of the saw, respectively, while Fig. 3 is a specimen cut illustrating the even motion of the saw blade.

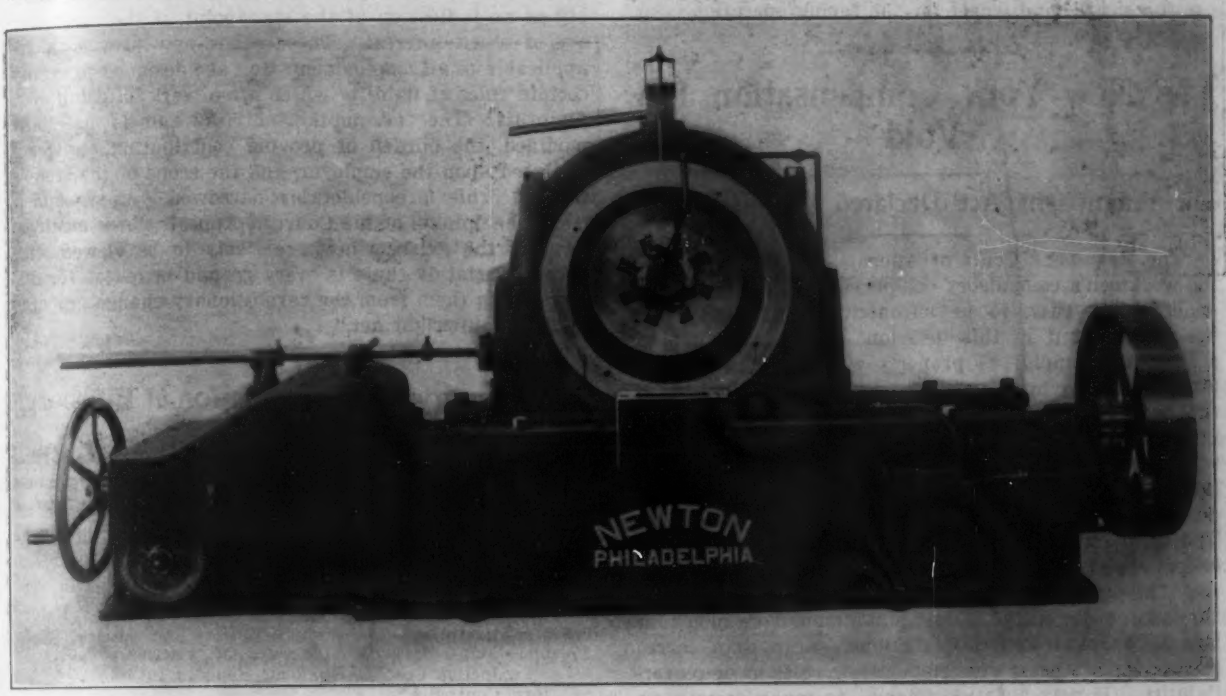


Fig. 1.—The Driving Side of a Cold Saw with Concave Blade Built by the Newton Machine Tool Works, Inc., Philadelphia, Pa.

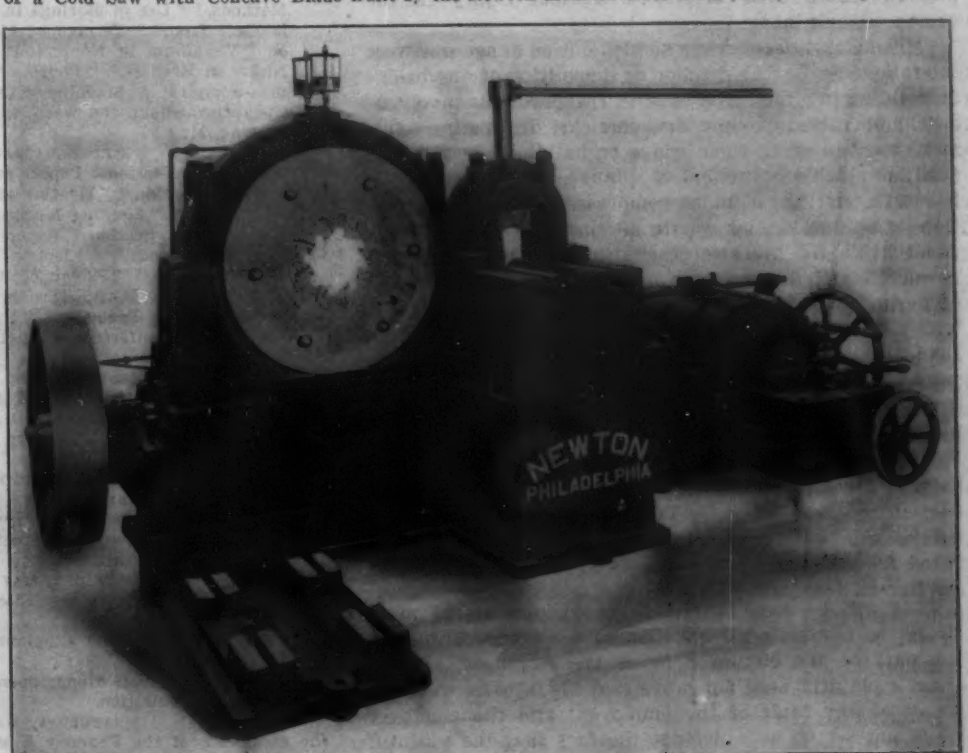


Fig. 2.—The Operating Side of the Saw.

The machine consists of a very heavy cylindrical barrel about 28 in. in diameter in the bearings. A bronze worm ring with teeth of steep lead is located on the periphery of this barrel and is driven by a hardened

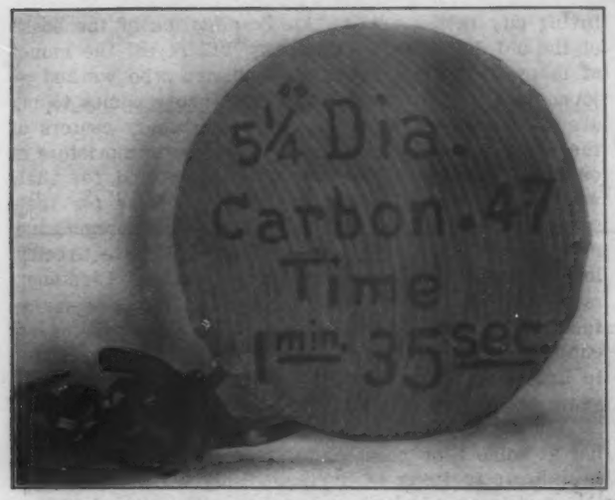


Fig. 3.—A Specimen Cut, Showing the Steady Motion of the Blade.

steel worm fitted with roller thrust bearings. The driving hub and worm wheel have a common bearing in the saddle which absorbs the opposed stresses due to the drive. This saddle is heavily constructed and the base and the cap are bolted together securely with ample provision for lubrication. Square locked gibbed bearings on the base with adjusting screws provide for wear. Nine changes of feed are secured through a gear box, and a reversing fast power traverse is also available. The feed screw of the large diameter and bearings at each end preserve the proper alignment.

The saw is driven by a 20-hp. General Electric motor. While it is not the first machine embodying the internal cutting principle, it is claimed to be the first on the market of a simple design having positive direct gear drive. The steady, even motion of the blade, even when working under very severe conditions and heavy feeds, is indicated in Fig. 3. It is possible to secure even greater feeds, but these are not recommended for commercial work.

Although this saw is rated as a 5-in. machine, it will clear 7 in. and has eight internal teeth in the saw blade These machines are especially adapted for cutting locomotive axles and are also peculiarly suitable for cutting automobile gear blanks from bar stock, as 12 and 15 in. sizes are also made.

The Pennsylvania Railroad has installed at West Brownsville Junction, Pa., a scale for weighing cars while in motion. The new "52-ft. track scale with mechanical hump," as it is called, has great advantages over other existing scales. Probably the most ingenious feature of this new scale is what is called a relieving gear, an arrangement of jacks operated by power which permits the scale mechanism to be completely disconnected from the track. By reason of this invention the heaviest engines can pass over the scale without registering a pound's weight; the disconnection is made without the least effect on the balance of the scale. The "mechanical hump" makes it possible to regulate the velocity at which the cars go on the scale. By raising or lowering the apex of the hump, the grade down which the cars run is increased or diminished at will. This is important because on different styles of cars the distance between the front and rear wheels varies, and as the weight can only be registered during the interval between the times when the rear wheels pass on the scale and the front wheels pass off, the velocity must vary inversely with the length of the wheel base.

The Sullivan Machinery Company, Chicago, has established a branch office at 35 Federal street, Boston, Mass., to permit more adequate service of its patrons in New England, eastern Canada and the Maritime Provinces. George E. Wolcott, for several years manager of New England sales at the company's Claremont, N. H., office, is in charge of the Boston headquarters.

The Rockford Shaper Down Feed

A new type of power down feed for shapers has been developed by the Rockford Machine Tool Company, Rockford, Ill. Fig. 1 shows the automatic variable feed to the head, as applied to one of the maker's shapers, while Fig. 2 gives the constructional details. The feed is simple in design and without complicated parts, so

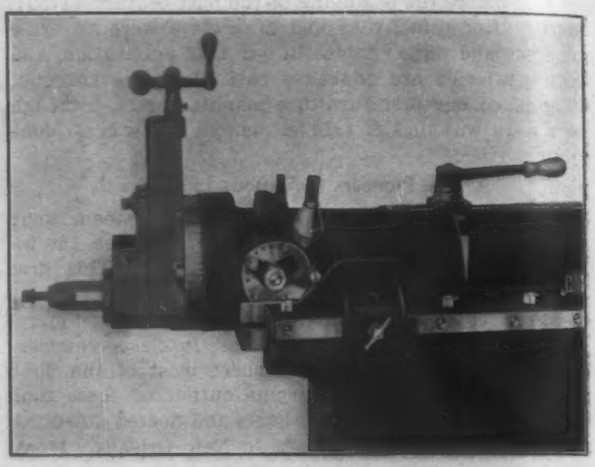


Fig. 1.—The New Power Down Feed for Shapers Made by the Rockford Machine Tool Company, Rockford, Ill.

that it is not readily subject to derangement. These give a feeding mechanism which is very serviceable. The tool can be fed up or down and the feed will operate at any angle. The cam piece, with the incline, on which the roller rides that actuates the feed, can be adjusted readily to suit the position of the ram or can be moved out of the way when not in use. The amount of

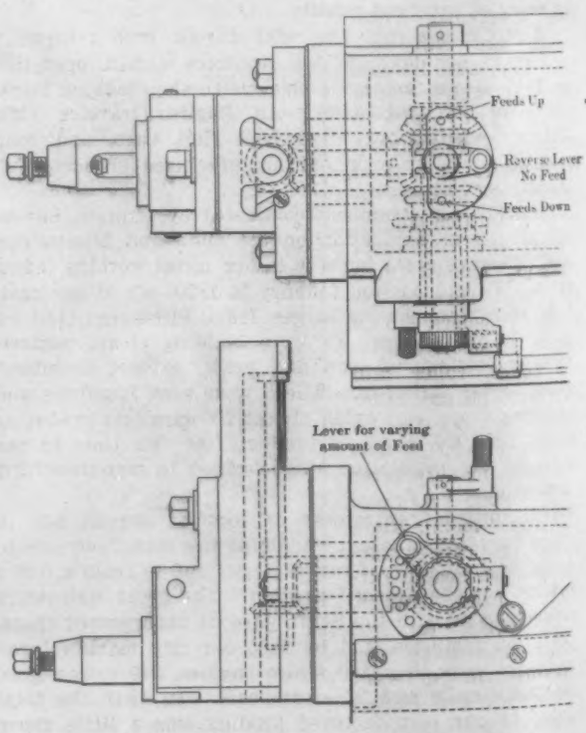


Fig. 2.—Plan View and Elevation Giving Constructional Details of the Mechanism.

the feed is regulated by the lever and the spring pin on the side of the ram, while the lever on the top reverses the direction. Six feed changes ranging from 0.008 to 0.048 in. are available, the difference between each of the changes being 0.008 in. The lever on top of the ram, which reverses the direction of the feed, has three positions, and when it is in the central one and the feed is not in use, the gears are thrown out of mesh.

Cincinnati's Industrial Development*

One hundred and sixteen years ago Cincinnati's 500 inhabitants dwelt in 94 log cabins and 10 frame houses. History tells us that in those early days her men were mechanics, blacksmiths, lock and gun smiths, shoemakers, &c. William McFarland was the father of our first manufacturing industry. He manufactured earthenware one year before the beginning of the past century (1799). Shortly after this Lyons and Magginnis were advertising desks and dining tables in our first publication, and these gentlemen are doubtless entitled to the honor of being called our first furniture manufacturers, although their work was that of cabinet makers and was all done by hand.

A Few Pioneers in Various Industries

In 1812 William Green built the first steam buhr mill; the machinery was put in by Oliver Evans, the inventor of the high pressure steam engine. This first steam engine, of 70 hp., sent here from the East, was at that time considered a wonderful piece of machinery, and so it was, for it put Cincinnati in closer commercial touch with New Orleans, where most of the flour produced was sold. The surplus output of these four 6-ft. buhrs was loaded on flat boats and floated down the Ohio to the Mississippi, thence to New Orleans. Many of the men who piloted the barges down these great rivers used to walk back through the wilderness.

Plows were first made here about the time the steam mill was put in operation. A blacksmith by the name of Miller was responsible for our first agricultural implements. In 1815, on the bank of Deer Creek, which is the present approximate location of Eggleston avenue, a white and red lead works was in operation, with a capacity of 6 tons of lead per week. This was one of the first three lead factories started between the Alleghenies and the Mississippi. The product of this works was noted by Dr. Drake, a public spirited man of that time, as being of excellent quality.

A steam saw mill was next started, with a capacity of 7000 ft. per day; and six tanneries were in operation by 1816, also a factory or blacksmith shop making a specialty of wrought nails. An English traveler (Mr. Palmer) visited our city about that time, and commented favorably upon our manufactured products and industrious citizens.

In 1817 the steamboat completed by Captain Shreve started steam navigation on the Ohio and Mississippi, and this gave great impetus to our metal working industries. We had no iron foundry in 1820—all of our castings were brought on barges from Pittsburgh, but by 1830, 10 years later, we were building steam engines, making castings of iron and brass, cabinet furniture, guns, locks, chairs, &c. There were nine foundries and machine shops, employing almost 200 men and producing about $200,000 worth of product. At this time 18 per cent. of our population was engaged in manufacturing industries.

Cincinnati's centralness of location served her in those days as in these, by enabling her manufacturers to get prompt supplies of raw material and to readily find a market for the finished product. The great waterways connecting us with the South gave us unsurpassed transportation facilities, and by 1835 our city manufactured annually more than 100 steam engines, 240 cotton gins, 20 sugar mills and 22 steamboats. In 1841 the total value of our manufactured product was a little above $18,000,000; and at the beginning of the Civil War it had increased more than sixfold.

The Beginning of the Machine Tool Industry

In 1838 an English machinist by the name of John Steptoe began the manufacture of machine tools, an industry which seems peculiarly adapted to our location, and which has developed so substantially and so well that we are to-day the largest machine tool manufacturing city in the world. An examination of the books of the old John Steptoe Company will reveal the names of many of our present prominent men who worked as journeymen at ordinary wages, and whose names to-day are household words in the great machinery centers of the world. Some of these men are to-day proprietors of our largest establishments and are respected for their worth as public spirited citizens, as well as for their enterprising and progressive spirit. This progressiveness has not been confined to our day. Horace Greeley, in the New York *Tribune* 61 years ago, said: "Cincinnati is a focus and market for the grandest circle of manufacturing thrift on the Continent." He also spoke of our enterprising and energetic population. It is gratifying to know that Cincinnati appealed to this great man 61 years ago, as it does to visitors to-day.

What article of importance can be named that has not at some time been manufactured in Cincinnati? It is difficult to think of a single thing which our industrious citizens have not undertaken. The site of McFarland's earthen ware industry of 112 years ago can now be viewed from our famous Rookwood Pottery, whose product is recognized as the acme of art, and is treasured for art's sake all over the world. Our present vast manufacturing industries leading the world in many lines, and driven by automatic engines aggregating hundreds of thousands of horsepower, could not have grown from the lowly 70-hp. slide valve engine of 100 years ago to their present state without untiring effort and devotion to duty of our manufacturers.

Cincinnati's Industrial Rank

Cincinnati leads the world in the production of machine tools, woodworking machinery and engineering specialties. Cincinnati ranks first in the United States in the manufacture of acids, bookcases, office furniture, field musical instruments, harness and saddlery, laundry machinery, playing cards, printing ink, soap and vehicles. Cincinnati ranks first in the United States in the value of manufactured products in proportion to her population. She also ranks first in the United States in the value of goods originated for export, as a hardwood lumber market, as a lithographic center, as a whisky center. Cincinnati has one of the largest tanneries, also one of the largest cast iron pipe foundries in the United States. Cincinnati has the only railroad using steam operated locomotives owned by any city, the Cincinnati Southern. We have 2600 factories, employing over 82,000 workers. Our invested capital in industrial lines is close to $200,000,000, and we pay out annually in wages and salaries almost $45,000,000. Cincinnati ranks third in the United States in the manufacture of clothing, jewelry, shoes and electrical machinery.

I could go on quoting figures giving the enormous amount of materials used, our entire factory output, our leading products annually, freight shipped annually, &c., but these can all be obtained by consulting our last industrial census. Our metal industry alone gives employment to over 15,000 men and pays out in wages almost $4,000,000 per year. These concerns pay in taxes each year about $500,000. Broadly speaking, our artisans are skilled in over 250 different kinds of industries. A great number of our most useful citizens are engaged in some kind of manufacturing industry. The majority of these men have developed from the lathe or vise; men who learned how to work with their hands as well as their heads.

The Wetzel Mechanical Stoker Company, Trenton, N. J., has completed the installation of 18 of its mechanical stokers in the boiler room of the Peters Paper Company, Latrobe, Pa. H. W. Hendrickson, 1402 Park Building, Pittsburgh, is the stoker company's sales representative in Pittsburgh and vicinity.

The Employers, Builders and Material Men's Association of Gary, Ind., is amending its constitution so as to take in all employers in the county. The object is an alliance to enforce the open shop system in all the large factories in that district.

* Extracts from an address before the manual training department of the Hughes High School, Cincinnati, by W. L. Schellenbach, chief engineer Lodge & Shipley Machine Tool Company.

New Publications.

The Steel Workers. By John A. Fitch. Cloth bound, 8vo; pages, 380. Illustrated. Published by the Charities Publication Committee, New York. Price, $1.50; postage, 21 cents extra.

This book is one of the Russell Sage Foundation publications and is a part of the Pittsburgh Survey findings, the series consisting of six books. Like the Sage Foundation publications which have preceded it, such as "Work Accidents and the Law," it is excellent in typography and illustration and in all respects a high type of book making. The author was a fellow of the University of Wisconsin in 1908 and 1909 and was attached to the New York State Department of Labor in 1909 and 1910. It is stated in the preface by the editor, Paul U. Kellogg, director of the Pittsburgh Survey, that "Mr. Fitch entered upon his commission without any promptings other than the general instincts toward an independent resourceful citizenship inbred by the spirit of the northwestern prairies and that quickening sense of economic justice which stirs the University of Wisconsin." Much of the information with which Mr. Fitch deals was obtained from steel workers in Pittsburgh and the neighboring towns of Braddock, Duquesne, Homestead and McKeesport. Ten months were spent in the investigation and in that time the author went into every steel mill in Allegheny County. Like other investigators of his class Mr. Fitch evidently favors collective bargaining. He makes much of the fact that employers in the steel industry exclude the men from any voice in the conditions of their employment and emphasizes this fact repeatedly as an offset to whatever he describes in the way of betterment features or any increase in compensation or benefits made on the initiative of the employers. He makes much also of the "repressive measures" introduced by employers to enable the companies to retain the advantages which they gained for themselves when they eliminated the union. These, he says, have resulted in "a thoroughgoing and farreaching censorship that curtails free speech and the free activity of citizens. The effect of these measures is seen in every department of community life wherever in Allegheny County steel is made."

In the six chapters grouped under the general title "The Men and the Tools" Mr. Fitch presents interesting descriptions, generally accurate, of the processes of steel works and rolling mills, the design being to portray minutely and adequately the conditions under which labor of the various classes is performed. Emphasis is put upon its exhausting character and its risks. Another group of chapters deals with "The Struggle for Control." Here unionism and the union movement are considered historically, the policies of the Amalgamated Association are described and the story is told again of the great strikes in the iron and steel industry, particularly the Homestead strike of 1892. It is shown how unionism was gradually eliminated, leading up to the régime which the author describes in the third part of his book under the title "The Employers in the Saddle." Wages and the cost of living are discussed, the working day and the working week and the speeding up and bonus methods with their effect upon the earnings and the physical condition of the men. The concluding portion of the discussion deals with "The Steel Workers and Democracy," the first of the two chapters in this section treating of "Citizenship in the Mill Towns," and the second of "The Spirit of the Workers."

One of Mr. Fitch's conclusions is thus stated: "No reasonable person will deny that, to speak mildly, unfortunate conditions prevail in the steel mills. These are the result of a growth or evolution through a period of years and the important thing to be considered now is the direction that this growth is to take in the future. It would seem that if these conditions remain as they are at present, or grow worse, some kind of determined and effective opposition must eventually be encountered by the employers." The author considers that the Pittsburgh steel workers are very nearly ready for a political movement. "They are inwardly seething with discontent and the time is not far distant, if indeed it has not already arrived, when, with a leader who understands how to gain their confidence, they will flock from the standards of the old parties in a way that will be a severe shock to the machine politician."

One thing which writers of Mr. Fitch's type minimize is that many of the conditions they describe are a part of our industrial and economic system, and are not created by the industry or the particular corporation under investigation. The inference they would have the reader draw is that the corporation could change it all by a decree shortening hours and advancing wages; whereas hours and wages in one industry and in the works of one company are related to conditions in other industries and at the works of other companies. There is no line of testimony in "The Steel Workers" to the existence of a better standard of living or better mill conditions in the days of the union régime; yet the impression left with the reader is that with the "employers in the saddle," the worker fares worse than in the old days. No doubt the most significant facts in the evolution the industry has undergone in the past 15 years are the large introduction of the Slav and other European types to the displacement of the races dominant in the days of the union's power, and concurrently the mechanical revolution that has so greatly reduced the amount of skilled labor required in steel works processes.

Homestead: the Households of a Mill Town. By Margaret F. Byington. Cloth bound, 8vo; pages 292; illustrated. Published by the Charities Publication Committee, New York. Price, $1.50; postage, 20 cents extra.

The book is a companion volume to "The Steel Workers." In the foreword, by Paul E. Kellogg, it is said to be a partial answer to the question: "Shall the day's work afford an adequate basis for American livelihood?" It is explained that those who carried on the field work of the Pittsburgh Survey took up the factors affecting the welfare of the wage earning population—sanitation, housing and public education—while Miss Byington's commission was to analyze these and other factors in the life of Homestead as they bear on the well-being of the family. The book is divided into four parts, dealing respectively with "The Mill and the Town," "The English-Speaking Household," "The Slav as a Homesteader" and "The Mill and the Household." A somewhat intimate study was made of the life of 90 Homestead families. What is scheduled in the book in the tables relating to prices of commodities and the family outlay for all purposes over a period of several months deals with what is commonly spoken of as the cost of living. This is at a level, leaving small possibilities of savings in the case of an ordinary workman's family.

Miss Byington goes into other questions, and dwells on mill town life in its capacity to satisfy the desires of the average mill man's family. Allowance must be made in the comments of an educated woman of sensitiveness and sympathy, for a certain amount of aspiration and ambition which is attributed to the workers, and which is really in large part the author's. There is apt to be in such writing, too, a large element of theory and idealizing. Much of the work of the steel mill is exhausting, it is true, but it is much more so in the minds of persons physically unfitted for it who go to study it than to those who actually do it. Many industries make large demands upon those who work in them; from many, trying conditions are inseparable and cannot be changed.

The author refers to her study, which covered the late months of 1907 and the early months of 1908, as coming at the close of the longest period of prosperity known in this generation. She attempts to state, from her observations at Homestead, what that prosperity has brought to the rank and file of the people whose waking hours are put into the work of the steel mill. Her general impression can be gained from her epitome of the life of the men who are described as "turning daily from 12 hours in the din of the huge mills to home and supper, a smoke and bed." No question need be raised of the correctness of the statements made as to wages, hours, cost of living and the conditions found in the homes of Homestead workers. Such data are matters

of record, or may be obtained, as in this instance, by systematic inquiry. There is no doubt, moreover, that life in a one-industry town is full of monotony, particularly in a town in which the sights and sounds of the mill are making their unvarying impressions day in and day out upon the minds of the dwellers. But Homestead is not exceptional in this respect; in fact, certain features of its life are in advance of what is found in some steel works towns. Moreover, nothing is said of the great improvement over the conditions from which these workers and their families escaped when they came to the United States.

The author has brought out much concerning the régime of the 12-hour day, seven days in a week, as it has affected a certain proportion of steel works employees. It is stated that in the year covered by the study detailed in the book, one man in five worked on seven days in the seven in the steel mills of Allegheny County. In this connection this opinion of William B. Dickson is quoted from his paper before the American Iron and Steel Institute in May, 1910:

> It is my own deliberate judgment, after a period of almost 30 years' continuous connection with the industry, the early part of which was passed in manual labor in the mill, that the present conditions, which necessitate the employment of the same individual workmen 12 hours a day for seven days a week are a reproach to our great industry and should not in this enlightened age be longer tolerated.

There is no doubt, it may be said in passing, that the Pittsburgh Survey has contributed its share to the growing effort on the part of steel manufacturers to abolish as far as possible the seven-day week of 12 hours a day. Something may be due also to the Government inquiry into labor conditions at steel works.

Miss Byington's book is an intensely interesting human document. She has succeeded in transferring the atmosphere of Homestead to its pages and in giving the reader a vivid picture of mill town life as a product of the steel industry on latter day lines. With all allowances for the standpoint of the ideal from which the book has been written, there is a residual impression that something remains to be done for the steel works employee. It is quite certain, however, that the employing company is only one of a number of agencies through which betterment must come. The note of encouragement is not strong in this book; but it is not altogether lacking from the developments of the past year. These point definitely to a disposition on the part of American steel manufacturers, not only to improve working conditions, but in bonus, pension, benefit and accident compensation systems to add to the amounts distributed to workmen.

Scientific Management and Railroads. By Louis D. Brandeis. Cloth bound, 8vo; pages, 92. Published by the *Engineering Magazine*, New York. Price, $1.

Extracts are made in this volume from the brief submitted by Mr. Brandeis on behalf of shippers at the hearings on freight rates before the Interstate Commerce Commission. The grounds of Mr. Brandeis' contention that the railroads had great unutilized possibilities of economy are quite familiar. He introduced testimony from other industries, differing to be sure from the railroad, but contended that there was no difference between the railroads and these industries in the principles essential to the application of scientific management. Mr. Brandeis gives extracts from the testimony of a number of experts whom he introduced to the commission and develops the argument for the introduction of efficiency methods in railroad operations. His conclusion is thus stated:

> This investigation has developed clearly that the railroads to meet any existing needs should look not without, but within. If their net income is insufficient, the proper remedy is not higher rates, resulting in higher costs and lessened business, but scientific management, resulting in lower costs, in higher wages and increased business. If their credit is impaired, the proper remedy is not to apply the delusive stimulant of higher rates, but to strengthen their organizations by introducing advanced methods and eliminating questionable practices. Thus they will maintain credit by deserving it.

Paper Rope.—Another use for paper, new in this country, is a product of the Papyrus Artificial Paper Mfg. Company, now erecting a plant for the manufacture of paper and paper novelties at Kenilworth, N. J. The company has patents covering a rope made of several strands of paper covered galvanized steel wire. The rope thus produced is strong, tough and flexible, suitable for clothes lines and such uses. It is claimed that a rope of this kind will withstand the action of the weather 50 per cent. longer than cotton.

The Pennsylvania Railroad's New Ore Unloading Plant at Cleveland

The new ore handling plant to be erected in Cleveland, Ohio, for the Pennsylvania Railroad will be larger than any similar plant now in operation at Lake Erie ports. Brief mention of the award of this contract to the Wellman-Seaver-Morgan Company, Cleveland, was made in *The Iron Age* March 16.

The plant will consist of four Hulett unloaders, equipped with 17-ton buckets. At present the largest buckets have a capacity of 15 tons. In addition to larger buckets the plant will have heavier motor equipment and a somewhat higher speed of operation than previously built ore unloading machines. The weighing larry will have a capacity of 50 tons, as compared with 35 tons on previously built machines. The unloaders will be constructed to handle the cargoes of not only the largest ore carriers now on the lakes, but also of sufficient size to unload the ore from vessels of greater width and depth that may be built in the future. In the present season a new record has also been established in vessel construction in the placing of contracts for two larger lake boats than any now in commission. These are to be 617 ft. long and 64 ft. beam, being 12 ft. longer and 4 ft. wider than any of the present ore boats.

The new unloaders will have a center span of 71 ft., with cantilevers sufficient to cover the pit, which will be 35 ft. wide. One ore bridge will be used in connection with the four unloaders. This will have a center span of 266 ft. and an over-all length of 612 ft. The bridge will be equipped with a 15-ton bucket. The ore bridge will also be equipped with weighing hoppers for loading out. The equipment will all be electrically driven, direct current, 220 volts. The ore on being taken out of the boats can be weighed by machines for shipment and loaded directly on cars, or dumped into the pit in the rear of the machines for placing into storage. It is expected that the plant will readily handle two of the largest ore carriers, or from 25,000 to 30,000 tons of ore between daybreak and dark.

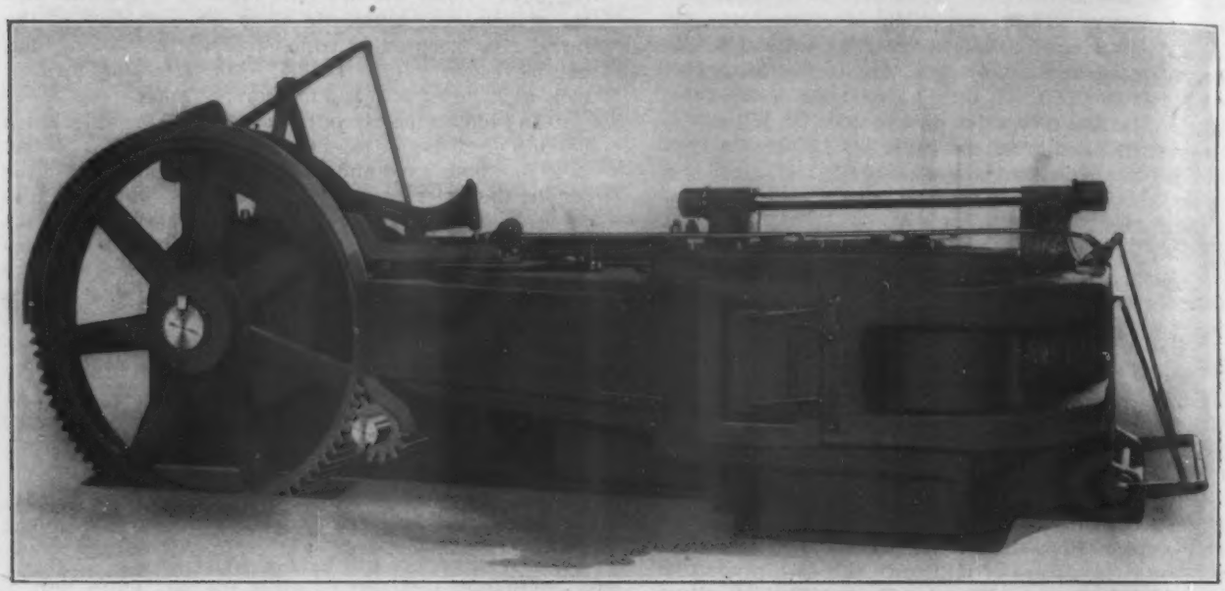
The new plant will be located on the lake front in Cleveland, a short distance west of the mouth of the Cuyahoga River. Preparatory to its erection and the establishment of large ore storage yards, the Pennsylvania Railroad has been engaged for a number of months in filling in an extensive tract of water front. The plant will be carried on concrete docks and piers. The contract calls for its completion in time for the opening of navigation in 1912. This gigantic plant will be located but a short distance from the main tracks of the Lake Shore & Michigan Southern Railroad, and the unobstructed view of it that it will be possible to obtain from the car windows is expected to attract much interest.

The Production of Fluorspar in 1909.—The quantity of fluorspar mined in the United States in 1909, according to a report just published by the United States Geological Survey, was 46,198 net tons. At the close of 1908 there remained unsold 16,864 tons of fluorspar, so that the sales in 1909, which amounted to 50,742 net tons, valued at $291,747, were supplied partly from stocks on hand. The principal fluorspar producing district in the United States is in western Kentucky and southern Illinois, and these two States shipped, respectively, 7800 tons and 41,852 tons in 1909. In 1909 Colorado, New Mexico and Arizona together produced 1090 tons, which was practically all taken by the open hearth plant at Pueblo, Colo., but this quantity was not sufficient to supply the demand.

A Huge Ajax Forging Machine

A 7-in. upsetting and forging machine, believed to be the largest ever built, was recently completed by the Ajax Mfg. Company, Cleveland, Ohio. This new machine is 2 in. larger than the biggest machine previously built and was shipped to the St. Louis plant of the Railway Steel Spring Company. The shipment was made on a special all-steel heavy trussed car, having four trucks, to sufficiently distribute the weight on the wheels, as the machine weighed 210,000 lb.

The construction of this machine is practically the same as that of the company's standard line of bolt heading, upsetting and forging machines, which are made in sizes ranging from ¾ to 5 in., for upsetting and forging, and with 3 in. as the maximum size for bolt heading. The smaller machines are geared at about 6 to 1, but this new one is geared 10 to 1, the slower speed, about 35 rev. per min., being provided to secure more power. The bed plate is a one-piece steel casting, and weighs about 90,000 lb., and the whole machine is 65,000 lb. heavier than the largest previously built by this company, which was of the 5-in. size and weighed approximately 145,000 lb. The flywheel of this machine is 80 in. in diameter. The power required to drive the machine is from 40 to 50 hp., and is transmitted to it by a belt. The floor space occupied is 20 ft. 6 in. x 15 ft.



A 7-In. Forging and Upsetting Machine Built by the Ajax Mfg. Company, Cleveland, Ohio.

The Davis 26-In. Turret Lathe

Recent Improvements in This Boring, Forming and Threading Machine

The W. P. Davis Machine Company, Rochester, N. Y., has recently made a number of improvements in its 26-in. turret boring, forming and threading lathe. These include a rearrangement of the driving mechanism, the addition of a gear box drive similar to that used on engine lathes, and increasing the size of the hole through the spindle. The foot lever on the front of the machine enables the feed to be reversed while the operator is using both hands. Automatic stops have also been provided for each face of the turret and for the carriage, and a number of other changes have been made in the interior construction, such as supplying steel gears and increasing the strength of the tool throughout. Fig. 1 is a general view of the lathe, while Fig. 2 shows front and end elevations, and gives an idea of some of the constructional details.

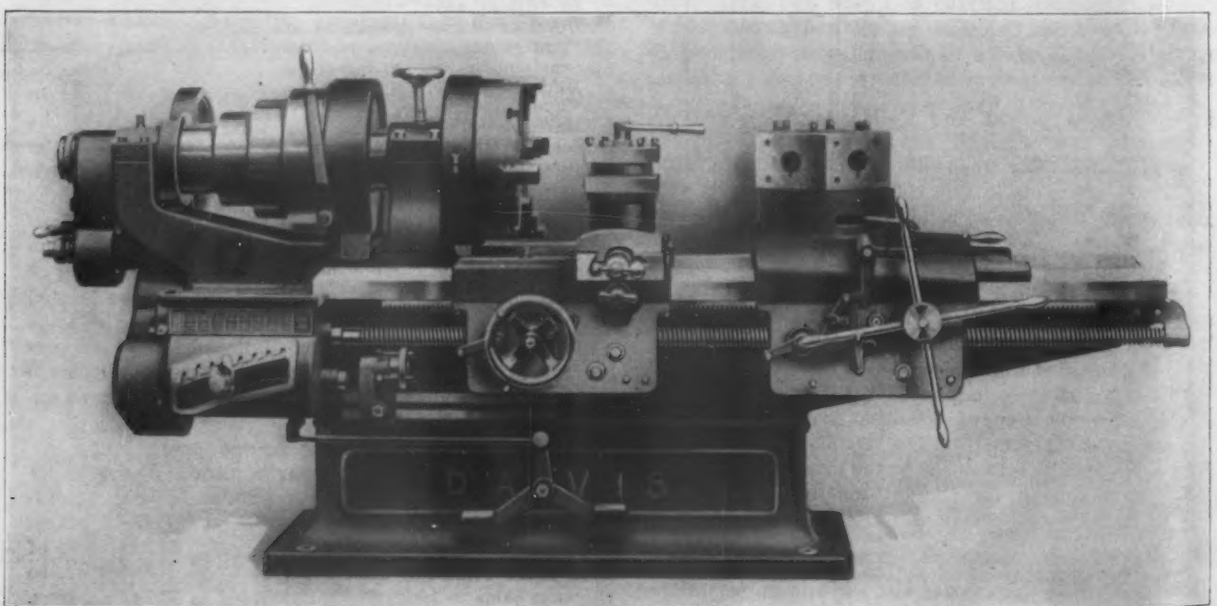


Fig. 1.—A 26-In. Turret Boring, Forming and Turning Lathe Built by the W. P. Davis Machine Company, Rochester, N. Y.

The machine has a geared friction head and a positive drive with the back gears, and the triple gear can be brought into mesh with the face plate when desired. High grade compressed babbitt metal is used for the bearings, and the holes for the shafts are bored. Ample

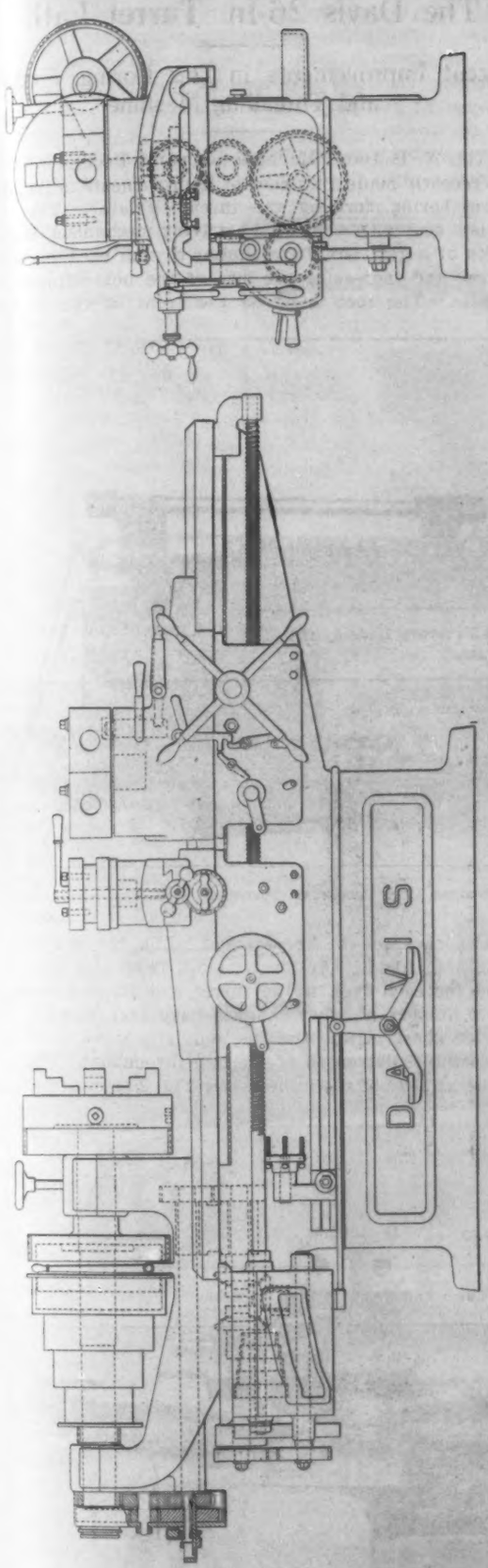


Fig. 2.—Front and End Elevations of the Lathe.

facilities for lubrication are also furnished. The spindle is made of a special grade of steel, and is equipped with a heavy 18-in., four-jaw, independent chuck of special design, which is clearly shown in Fig. 1. The cone pulley has four steps, and in connection with a two-speed countershaft and the back gears an extensive speed and feed range is possible.

The hexagonal turret is 6 in. high and measures 15 in. from face to face. Each of these faces is 8½ in. wide and has holes 2½ in. in diameter, made with a key seat and a key to prevent boring bars from turning in the turret when they are used. The center is open, so that a mandrel can be passed entirely through. A locking device holds the different faces in alignment with the spindle, and automatic stops for each face of the turret give independent tripping points in the longitudinal movement of the saddle. For attaching forming tools each turret face has four tapped holes.

The saddle supporting the turret is 25 in. wide, has a bearing of 30 in. on the bed, and its longitudinal travel is 40 in. Both hand and power feed are supplied for the saddle, the latter having 16 feed changes, which can also be used for thread cutting. A pilot wheel controls the hand feed, and the foot lever at the front of the machine enables the power feed to be reversed quickly. The change gear box allows changes from one feed or one thread to another to be made instantly. A very simple index plate is used, which indicates the changes, so that they may be secured without waste of time, and at the same time avoids the likelihood of making mistakes. With this gear box, 32 changes, ranging from 2 to 32 threads per inch, are possible, and, by changing the end gears, special or fractional threads can be cut.

Hand and power feed are furnished for the carriage which has an automatic stop for the longitudinal feed and a cross slide with power cross feed upon which a four-sided tool post is mounted. Revolving the tool post brings into use any one of the four different tools, doing away with a great deal of tool changing. In common with the turret saddle the carriage is driven by a lead screw, so that either one can be used for thread cutting. Dustproof, self-oiling friction pulleys with a bushing containing a recess for the lubricant are supplied with the countershaft as well as self-oiling hangers.

The following table gives the principal dimensions and specifications of the lathe:

Swing over carriage, inches	18
Swing over ways, inches	26
Diameter of hole through spindle, inches	3⅛
Front spindle bearings, inches	4⅞ x 7
Rear spindle bearing, inches	4¼ x 5¼
Minimum number of threads per inch	2
Maximum number of threads per inch	32
Maximum distance between chuck and turret, inches	50¼
Diameter of smallest cone pulley step, inches	8
Diameter of largest cone pulley step, inches	16
Face width of cone pulley steps, inches	4
Diameter of countershaft pulleys, inches	18
Face width of countershaft pulleys, inches	5½
Number of countershaft speeds	2
Minimum speed of countershaft, revolutions per minute	140
Maximum speed of countershaft, revolutions per minute	160
Floor space, inches	48 x 144
Net weight, pounds	7,000
Export shipping weight, pounds	8,000
Size of case for export, inches	48 x 72 x 144

The equipment furnished with the lathes includes all the accessories ordinarily supplied with a tool of this character, except the oil pan and pump, which if desired can be supplied at a slight extra cost.

The Vanadium Mines Company, whose general offices are in the Frick Annex Building, Pittsburgh, produced March 22 its first lot of ferrovanadium at its plant in Rankin, Pa. It will be in position to ship ferrovanadium to consumers after April 10. W. A. Boritz, vice-president and general manager, is making a trip of inspection to the company's oxide plant at Cutter, New Mexico.

The Hazleton Commercial Club has been organized at Hazleton, Ind. The president is E. C. Shute; vice-president, C. J. Snyder; secretary, F. L. Steelman; treasurer, H. P. Phillips. The club will seek to attract new industries to the city.

The Remington Bench Lathe

Attachments Adapting It to a Wide Range of Uses

Several new features have been embodied in the bench lathe and its attachments built by the Remington Tool & Machine Company, 50 Congress street, Boston, Mass. These include a combination screw feed and lever feed tailstock, the use of sliding feet to secure the requisite belt tension, independent turret slide stops, a graduated swiveling tool post on the forming slide and lever and screw feed for the milling attachment. In Fig. 1 a lathe equipped with a tailstock having the combination screw and lever feeds is shown, Fig. 2 illustrates the tool with the belt tension device and the two types of feed for the milling attachment, and Fig. 3 gives a view of the lathe equipped with the independent stops on the turret slides.

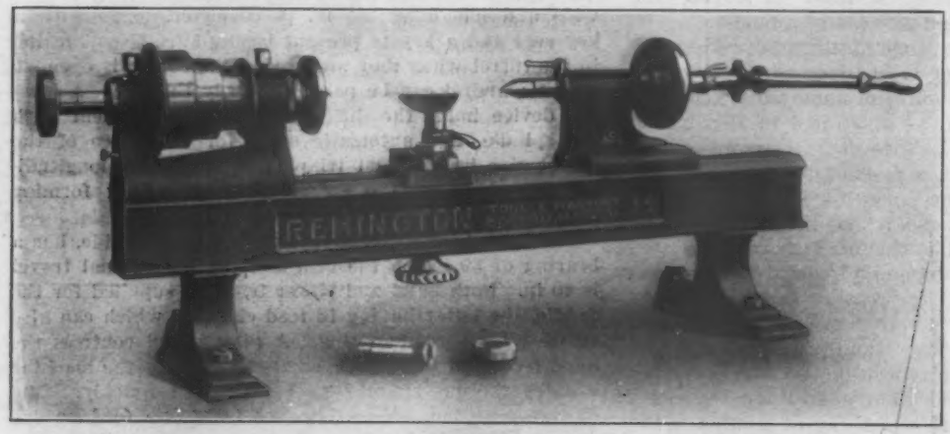


Fig. 1.—Bench Lathe with Combination Screw Feed and Lever Feed Tailstock Made by the Remington Tool & Machine Company, Boston, Mass.

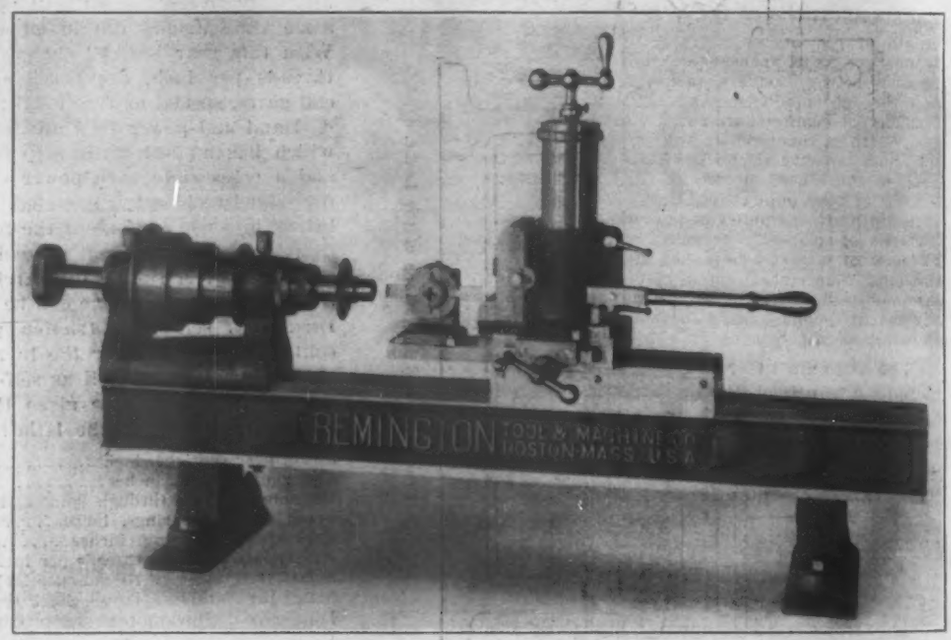


Fig. 2.—The Lathe Equipped with Lever and Screw Milling Attachment Feeds.

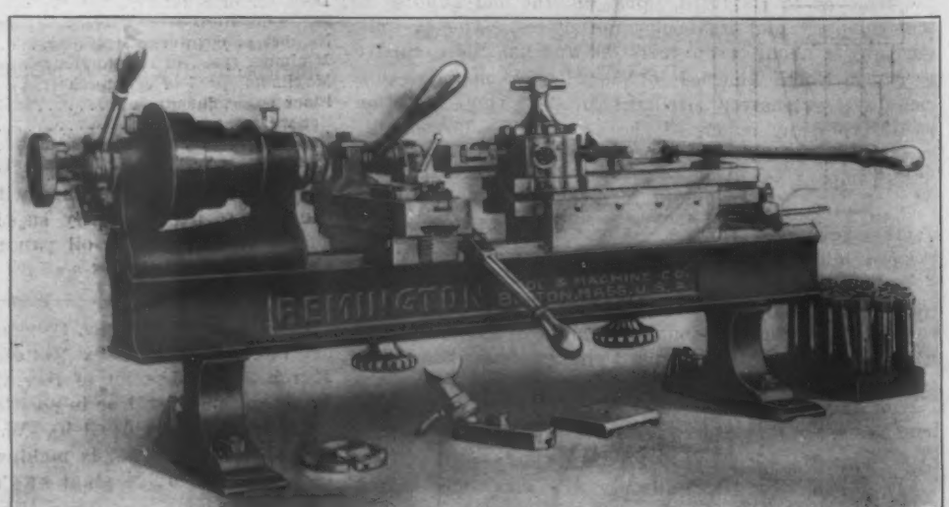


Fig. 3.—The Tool with Independent Stops on the Turret Slide.

The bed is heavier than that ordinarily employed, and is further reinforced by internal ribs to prevent springing under heavy cuts and secure extreme rigidity. A crucible tool steel spindle hardened and ground both internally and externally is used with a 3-degree taper in one bearing and a 45-degree taper in the other. A hole extends through the live spindle, which will pass ¾-in. stock when a universal chuck is employed. The draw-in spindle engages self-centering spring collet chucks, and enables round stock having a maximum diameter of ⅝ in. to be fed through. The spindle nose is threaded to take face plates, jaw chucks, &c. For the spring collets a 15-degree taper was adopted as furnishing the maximum grip on the stock with a minimum pull on the threads of the spindle and the chucks. The tool steel used for the bearings is hardened, ground and lapped to a fit, and ample provision is made for lubrication. The adjustment for the end thrust of the spindle is accomplished by advancing a serrated fiber collar until it comes in contact with the shoulder on the front of the spindle. This relieves the strain and the thrust on the angles of the spindle and enables ½-in. holes to be drilled continuously without having the spindle stick or stop, with the attendant excessive wear on the two angles.

All vibration is resisted by the design of the headstock, which has a reversed three-step cone pulley for a 1¼-in. belt. The large flange of the cone pulley is drilled with 60 holes for engaging a tension stop pin when indexing and spacing work is held in the spindle. The tailstock is also of heavy construction, and provides

for adjustment for wear on the eccentric binding bolt. It has a combination screw feed and lever feed for the spindle, as shown in Fig. 1, which has a horizontal movement of 3 in. A tipover T-rest, which is also shown in Fig. 1, enables the operator to remove the upright portion of the rest temporarily to secure greater access to the work without losing the original setting of the rest. Its design is the reverse from that ordinarily used, and the binder handle is at the base of the rest where it does not interfere with the tools or the hand. A locking ring is used to hold the rest rigid in place of a binder.

New belts cause waste of time until they are stretched, and even then the breaking of the lacing and the wearing out of the holes are a source of annoyance. The legs of this tool rest on shoes, as illustrated in Fig. 2, and can be adjusted through a range of 2 in. by an adjusting screw. In this way it is possible to use lapped and continuous belts, and at the same time secure the proper tension between the countershaft and the machine. The countershaft bearings are of babbitt, and are lubricated by wicking, which takes its supply from drip cups that also collect the surplus oil for reuse. Three speeds are provided: a fast forward, a slow forward and a reverse speed. The loose pulleys are slightly smaller in diameter than the tight ones to relieve the belt tension when the machine is not in use. For controlling the speed three treadles are furnished which can be secured to the floor.

The following table gives the principal dimensions and specifications of the lathe:

Length of bed, inches	36
Swing over ways, inches	8¾
Distance between centers, inches	18
Hole through spindle, inches	⅝
Diameter of countershaft pulleys, inches	5
Face width of countershaft pulleys, inches	1½
Maximum capacity of chuck, inches	⅝
Angle of chuck head, degrees	15
Number of cone pulley steps	3
Face width of cone pulley steps, inches	1¼
Diameter of smallest cone pulley step, inches	3½
Diameter of largest cone pulley step, inches	5
Maximum countershaft speed, revolutions per minute	1,000
Minimum countershaft speed, revolutions per minute	500
Net weight, pounds	156
Shipping weight, pounds	175

The attachments which can be supplied with the lathe include a milling attachment, which can be used with the lever shown in Fig. 2 as a hand milling attachment, or with the ball crank handle for screw feed, a six-hole turret having independent stops for each tool as illustrated in Fig. 3, and a forming and cutting-off slide having a swivel tool post graduated in degrees, so that straight forming cutters may be used in turning any degree of angle, and internal and external grinding attachments.

The Rowe Calk Company has purchased the entire capital stock of the H Calk Company of New York and has removed to Hartford, Conn., all the merchandise of that company and its books and offices. The H Calk Company is about seven years old and has the exclusive agency in North America for the H calks made in Germany and extensively used in Europe. The absorption of this company is one of the first steps following the enlarged organization and increased capital of the Rowe Calk Company.

The Foos Gas Engine Company, Springfield, Ohio, shipped, March 22, to the United States Government two Foos engines for use in operating one of the dams in the Ohio River improvement work near Wheeling. These engines are designed along the lines of the company's heavy duty vertical multiple cylinder type, consisting of three cylinders, each of 100-hp. capacity. They are part of an order recently received and will be installed at dam No. 8.

The Pennsylvania Railroad Company has added $200,000 to its annual appropriation for employees' pensions. With increases to be made this year by its affiliated lines, the amount set aside annually for the employees of the Pennsylvania Railroad system east of Pittsburgh and Erie is more than $850,000.

The No. 1-2 Bridgeport Motor Driven Grinder

A motor driven machine that can be used as a grinder, buffer or polisher is offered by the Bridgeport Safety Emery Wheel Company, Bridgeport, Conn. Fig. 1 shows the machine with one grinding and one buffing wheel. Fig. 2 shows it with two grinding wheels and a water pot, and the door in the base opened so that the starting switch may be seen.

The machine has a wheel at each end so arranged that either one or both can be removed from the spindle and extra heads screwed on. These fasten on the outside of the spindle and are used for running cotton buffs, felt wheels, wire cleaning brushes and various other attachments of a similar character. This arrangement is shown at the right of Fig. 1 as well as the use of a grinding wheel on the other end. The grinding of small pieces such as drills, lathe and planer tools, cold chisels and

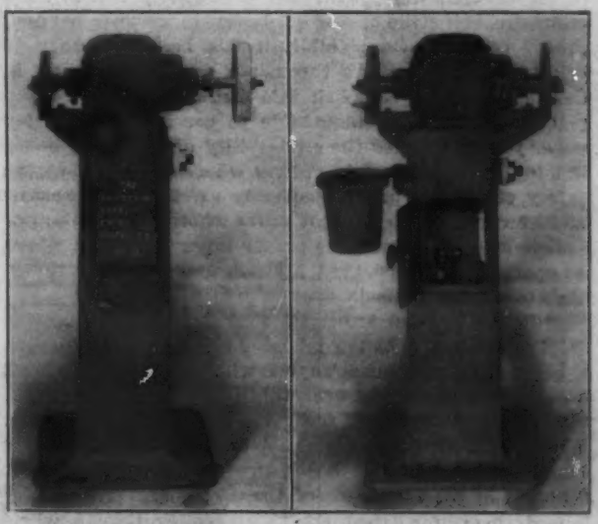


Fig. 1.—The Machine Arranged for Buffing.

Fig. 2.—View Showing Starting Mechanism.

Two Views of the No. ½ Emery Grinder Built by the Bridgeport Safety Emery Wheel Company, Bridgeport, Conn.

general grinding on small castings and wrought iron pieces can be done on this machine. If there is danger of drawing the temper of work ground, a water pot can be arranged on the side of the base as shown in Fig. 2.

The motor used with this machine can be wound for any of the standard direct current voltages and any of the customary frequencies and voltages of alternating current. The motor starter is mounted inside of the column and is readily accessible by opening the door in the base as shown in Fig. 2. A snap switch on the outside of the machine stops the motor.

The following table gives the principal dimensions and specifications of the machine:

Maximum diameter of the wheel, inches	8
Hight from floor to spindle center, inches	40
Diameter of spindle in bearings, inches	⅝
Diameter of spindle between flanges, inches	⅝
Distance between wheels, inches	17
Length of spindle, inches	22
Complete weight of machine, pounds	350

If desired an attachment for grinding twist drills can be furnished.

The Westinghouse Machine Company has recently received an order from the Solvay Process Company, Syracuse, N. Y., for a 750-kva., three-phase, 60-cycle, 480-volt, 3600 rev. per min. turbo-generator. The generator will be furnished by the Westinghouse Electric & Mfg. Company.

The annual meeting of the United Metal Trades Association of the Pacific Coast will be held at Tacoma, Wash., April 14 and 15. Annual conventions have hitherto been held by this association either at Portland, Ore., or Seattle, Wash.

Safety Collars for Emery Wheels

Charles G. Smith, president of the Pittsburgh Emery Wheel Company, Park Building, Pittsburgh, Pa., makes the following reply to an article by R. G. Williams, department of tests, Norton Company, Worcester, Mass., which appeared in the *Iron Trade Review* of March 9, taking exceptions to some points stated by Mr. Smith in a paper on "The Practical Use of Abrasive Wheels in Foundries," read before the Pittsburgh Foundrymen's Association: *

"The paper referred to was written by me at the solicitation of the Pittsburgh Foundrymen's Association, and in it I mentioned only such points as I positively knew from many years' practical experience to be proved facts, regardless of any commercial or advertising motive, and will say that all points mentioned therein will prove out in foundry practice. The writer has spent many years in trying to force into conspicuous recognition the factor of safety along with that of efficiency, and in these efforts to bring the factor of safety to as near a 'fool-proof' condition as possible, it has been necessary to bring the safety collars through a series of changes in development to accomplish this end, as there are many places wherein it is impossible to use a hood. In my paper you will notice the advisability of using the hoods in addition to the safety collars where possible, but the safety collar has proved perfectly safe, and I know of no instance in the past eight years where these collars of sufficient thickness and the proper taper were used where an operator has been even injured, and there are thousands of sets of them in use.

"Regarding the inference that I intimate that the safety collars add to the inherent strength of the wheel, it is hardly possible that anyone who would be considered a practical man would even think this to be a fact, but any practical man will recognize the fact that a 24-in. wheel, 2 in. at the face and 3¼ in. at the spindle, being tapered on both sides, has a great deal more inherent strength in the resistance of the centrifugal strains of a 2-in. face even without the safety collar than a wheel that is 2 in. at the face and also 2 in. at the spindle. This, in addition to the outside protection that the safety collars give when these are made of steel castings ¾ in. thick finished, not only enables the running at a speed that gives a much higher degree of efficiency, but should a wheel either by accident or by carelessness become broken will positively hold the parts together and prevent them from flying. The possibility of a small piece breaking outside the rim of a collar is a great deal less than where a hood is used and no safety collar, permitting the piece to hit the rest and glance off, striking the operator; in the latter case the operator has no warning whatever, but in the former possibility the piece will invariably break in a cross section at some point beneath the rim of the collar, and even should the rest be sufficiently strong to break the wheel in this shape (this being the only way in which a well made wheel can be broken in cross sections), the collar will hold it sufficiently long, even should it get away, to enable the operator to get from in front of the wheel. This fact has been proved in the few instances where such condition existed.

"I have always tried to refrain from using ambiguous terms, and cannot see wherein it is possible to get any impression that grinding wheel accidents are caused by inherent deficiencies in the wheels. While I do not know what Prof. Benjamin's experiences have been I do know, according to my experience (and I know of no one who has been in closer touch with grinding conditions for many years than myself), that there is a very small percentage of breakage from this cause, and would consider that more wheels are broken on account of the heating in the spindle caused by overheated bearings, thereby expanding sufficiently to crack the wheel, and such a condition as the operator allowing the piece to catch between the rest and the wheel is on the face of it carelessness and not an accident, as the rest should at all times be kept sufficiently close to the wheel to prevent all such possibility.

"There are also other cases, especially on such machines as large boring mills, lathes, and planers where emery wheels are used, necessitating such continuous contact without intermission for a sufficient length of time to cause the wheel to become so hot by virtue of the work it has to perform that it will break of its own expansion or contraction. Then, of course, there are other abuses whereby the operator in performing heavy work will hit the wheel beyond its resisting strength; this is also carelessness, but all of these points whether accidents or carelessness must be guarded in the safest possible manner, and my experiences have led me in to the most severe conditions of practice, and the safety collars have always proved sufficient, except in places where it is necessary to have more than 3 in. of the wheel exposed beyond the rim of the collar, in which case a hood should always be used in addition to the collar.

"The adoption of these safety collars has been antagonized by many of the abrasive wheel manufacturers from the fact that it requires considerably more material to make a wheel safety shape than straight. As stated in my paper, it is admitted to be a difficult operation to finish these wheels sufficiently accurate to fit the collars, but we find no difficulty whatever in doing so, but as it is impossible to secure any more money for these wheels with the additional cost of manufacture the proposition touches on the percentage of profits that may be secured from the output. We, however, find that it is possible for us to meet competition in price of the straight side wheels and make a reasonable margin of profit for ourselves, realizing, however, we could make more profit by supplying straight side wheels. The writer has been deeply impressed for many years with the importance of safety in practice, so I have devoted most of my time developing along these lines, and in developing these features found that a much higher degree of efficiency went hand in hand with safety."

* This paper was printed in *The Iron Age* of October 20, 1910.

Port Mann, the New Canadian City

Port Mann, which is to be the Pacific Ocean terminal point of the Canadian Northern Railway, is being carved out of a wilderness. The forest has disappeared, logging has been completed, and the time is at hand when building will commence. The town site is at the mouth of the Fraser River, almost exactly opposite New Westminster. It is there or near there that the British Columbia Steel Corporation's plant is to be built. This company is supposed to be a Mackenzie & Mann enterprise in part, and, if it is, it is more or less identified with the fortunes of the Canadian Northern Railway, of which the members of that firm are the controlling spirits. The names of the provisional directors are those of clerks in a Toronto law office, so that nothing as to the steel company's auspices is hinted in the notice of the granting of the charter. In some of the items that have been published, the enterprise has been connected with the Western Steel Corporation. It may be that two undertakings have become confused in the minds of news service associations. Last week a cargo of 5821 tons of rails from Sydney, N. S., arrived at the newly constructed pier at Port Mann. They are for the Canadian Northern Railway line across British Columbia, and were shipped via Cape Horn.

The Jeffreys-Spaulding Mfg. Company, Chase City, Va., has the following officers: R. M. Jeffreys, president; S. B. Jeffreys, vice-president; A. L. Jeffreys, secretary and treasurer; S. E. Spaulding, general manager. Its plant, which is an entirely new one, has been in operation about six months, having begun about October 1, 1910. The company manufactures box shooks for the soap, oil and meat trades, crating of all kinds and general mill work. The plant is equipped with the latest improved machinery and labor saving devices, including up-to-date dry kilns and a very complete filing room. It manufactures North Carolina and Virginia pine lumber exclusively.

Trade Publications

Universal Double Sawing Machine.—The Tannewitz Works, Grand Rapids, Mich. Circular. Deals with a universal double sawing machine which is said to embody in its construction a large number of improvements.

Valves.—Nelson Valve Company, Philadelphia, Pa. Circular. Illustrates and describes a few of the bronze, iron and steel valves which this company manufactures. The various styles covered include bronze gate, combination globe and angle and swing check valves and iron gate valves. The salient features of each class of valves are given, and the illustrations show the different styles which can be supplied.

Logging Machinery.—Soule Steam Feed Works, Meridian, Miss. Catalogue. Size, 6 x 9 in.; pages, 61. Treats of a number of sawmill specialties and especially a steam feeding device and lumber stackers. Both of these machines are illustrated and described at length, together with their various accessories.

Voltage Regulators, Drum Controllers and Generators.—General Electric Company, Schenectady, N. Y. Three bulletins. No. 4791, superseding Nos. 4218, 4219, 4346 and 4459, describes the company's induction and switch types of feeder voltage regulators for both hand and automatic operation. It contains connection and dimension diagrams as well as weights of the different regulators described. No. 4811, superseding No. 4600, contains a considerable amount of descriptive matter and data on drum controllers for industrial service. No. 4812 relates to small direct current generators ranging in capacity from 1¼ to 20 kw., which are suitable for lighting small plants, hotels, residences, factories or mills where the average length of the feeder circuits is 400 yd. or less. The generators are provided with sliding bases, which facilitate adjusting the belt, and can be installed on the floor, wall or ceiling. With the exception of the smallest size, all of the generators are provided with commutating poles, which render a change in the position of the brushes unnecessary when the load changes. The bulletin also contains a table of ratings, weights and dimensions.

Toolroom Furnace.—Rockwell Furnace Company, 26 Cortlandt street, New York City. Bulletin R. Points out the advantages of a combination toolroom gas furnace which embodies in one eight distinct types of furnaces. The illustrations show the furnace in use in three different ways and a number of other furnaces which this company manufactures.

Wires and Cables.—General Electric Company, Schenectady, N. Y. Bulletin No. 4787. Devoted to the subject of wires and cables. Contains data on all types of wires and cables and a discussion of the factors to be considered in choosing cables for various classes of work. Space is given to fuse and junction boxes, and a complete index renders the finding of any subject an easy matter.

Sand Blasts.—J. M. Betton, 178 Washington street, New York City. Folder. Calls attention to the Drucklieb injector sand blast apparatus, and contains directions for connecting and operating it. Two views of the apparatus and a table of the sizes in which it is made are included, as well as a table of the cubic feet of free air required per minute for varying diameters of nozzles. An illustrated description of this apparatus appeared in *The Iron Age* January 5, 1911.

Hose Nozzles.—Andrew J. Morse & Son, Boston, Mass. Catalogue. Size, 5½ x 9 in.; pages, 27. Lists the various types of the Invincible nozzle for use on hose wagons, aerial ladders, water towers, tug and fire boats, mills, docks and lumber yards. The dimensions of the various nozzles are given and a number of tables complete the catalogue.

Milling Machines and Thread Milling Attachment.—The Garvin Machine Company, Spring and Varick streets, New York City. Three circulars. In No. 153, illustrations and descriptive matter explain the operation of the No. 21 plain milling machine, an illustrated description of which appeared in *The Iron Age* May 16, 1907. No. 154 deals with three sizes of hand millers, which are designed for work requiring light quick cuts. No. 155 describes and illustrates a thread milling attachment for operating on worms, the threaded nose ends of spindles, &c. In all three circulars the machines and attachments are illustrated with brief tables of dimensions.

Traction Engine.—The Holt Mfg. Company, Stockton, Cal. Bulletin No. TE 40. Pertains to the Caterpillar line of traction engines, the special features of which are a special type of traction wheel consisting of a row of carbon steel plates 3½ in. wide, that enables it to be used on all classes of soil and a high efficiency. These series of steel plates operate around four cast steel truck wheels and are so shaped as to give a firm grip on the road surface. There are numerous illustrations showing these engines in use under various conditions, and a partial list of users completes the bulletin.

Fuel Economizer.—Cornell Economizer Company, 55 De Long Building, Philadelphia, Pa. Pamphlet and chart. The former describes the Cornell fuel economizer and smoke consumer and tells how it operates. The chart consists of two concentric circles, the outer having gauge pressures in pounds per square inch, and the inner the temperature of the feed water in degrees Fahrenheit printed on them. In use the temperature and the pressure circles are set in accordance with the conditions existing, and the decimal given on the inner circle is subtracted from that on the outer one, the result being the factor of equivalent evaporation at an atmospheric pressure of 14.7 lb.

Pneumatic Drills.—Ingersoll-Rand Company, 11 Broadway, New York City. Bulletin No. 2007. Shows the various types of Imperial piston drills which are used for drilling, tapping, reaming and flue rolling. The motor used in this tool is of the three-cylinder reciprocating type, and the cylinders and the pistons revolve around a strong main bearing, which serves as a valve seat for the rotating valve carried by the cylinders. Two special features of the drill are that no vibration is perceptible at any speed, which is due to having all the parts perfectly balanced and revolving around fixed centers, and that the main pin forms a Corliss valve for both the admission and the exhaust air. There are a number of illustrations showing the drill in use, and an illustrated list of repair parts completes the bulletin.

Melting Furnaces.—Hawley Down Draft Furnace Company, 736 West Monroe street, Chicago, Ill. Bulletin No. 33. Contains data on foundry practice, and shows the advantages of using the Hawley-Schwartz melting furnace instead of crucibles. An illustrated description of a portable furnace of this type appeared in *The Iron Age* October 13, 1910.

Presses and Emery Wheel Machinery.—Joseph T. Ryerson & Son, Chicago, Ill. Circular. Concerned with the line of presses and emery wheel machinery which this firm handles.

Shop Trucks.—Spicer Mfg. Company, South Broadway, New Philadelphia, Ohio. Pamphlet. Lists a line of trucks for use in industrial plants of various kinds. These range from a tin plate truck having a capacity of 2 tons up to a 10-ton bar mill ingot truck. Space is also given to a small hand truck, an adjustable wire reel, nail cleaning barrels and emery grinders.

Friction Transmission.—The Rockwood Mfg. Company, Indianapolis, Ind. Pamphlet. Size, 6 x 9 in.; pages, 91. This is the third edition of a book which was originally published in 1902. To bring the matter contained in the pamphlet up to date the revision has been very thorough, and it now presents the more general uses of friction transmissions as met with in daily practice and gives notes and formulæ readily adaptable by the layman to the design of drives. The various types of frictions are illustrated and described, and there are extensive tables of dimensions and prices.

Fuel Oil Burner.—Tate, Jones & Co., Inc., Empire Building, Pittsburgh, Pa. Circular No. 134. Relates to the Kirkwood portable fuel oil burner of the compressed air type. The special feature of this burner is that one hose connects the tank and the nozzle, thus making it more convenient and easy to handle than portable burners of the two-hose type. The mixing of the oil and the air is accomplished by the burner, which is located on top of the tank, and the movement of one handle on the burner regulates the oil supply, the ratio between the air and the oil always being maintained at a constant point.

Concrete Reinforcement.—C. A. P. Turner, 816 Phenix Building, Minneapolis, Minn. Pamphlet. Deals with the Turner mushroom system of concrete reinforcement, which is so called from the peculiar formation around the column head and from the rapidity with which it may be erected. The special advantages claimed for this system are that the floor slabs transmit the load directly to the columns without the use of beams and girders and the centering is simplified while at the same time the reinforcement is arranged so as to secure the maximum efficiency of the material. There are a number of illustrations showing buildings where this system has been employed, and at the present time it is being used in the construction of the Milwaukee warehouse of the International Harvester Company, as was announced in *The Iron Age* February 9, 1911.

Valves.—Nelson Valve Company, Chestnut Hill Station, Philadelphia, Pa. Set of stickers. These embody the changes which have been made since the last number of the company's catalogue was issued and are intended to be pasted in the catalogue on the different pages. In each case the page upon which the sticker is to be pasted, the number of the table it replaces and its own number are given, which makes it a very easy matter to revise the catalogue and bring it up to date quickly.

Friction Clutches.—The Carlyle Johnson Machine Company, Manchester, Conn. Catalogue E. Size, 4½ x 7 in.; pages, 35. Deals almost exclusively with the driving of machinery through friction clutches, although some attention is paid to driving from line shafts. Complete tables and lists of repair parts for all of the different clutches described are included.

Electric Lighting.—Cooper Hewitt Electric Company, Eighth and Grand streets, Hoboken, N. J. Two bulletins. No. 36, superseding No. 23, is concerned with the type P indoor direct current lamp. The construction of the lamp is described at length, brief specifications given and instructions for starting the lamps included. No. 37 points out the advantages of the Cooper Hewitt lamps for industrial lighting.

The Machinery Markets

A noticeable improvement is shown in the machinery market in the Middle West, but in other sections trade is rather dull. The Railway Appliance Show held in Chicago last week in connection with the convention of the American Railway Engineering and Maintenance of Way Association stimulated trade there, and the International Harvester Company is buying liberally. The Northwestern Railroad has a list out in Chicago calling for $12,000 worth of machinery, and the Rock Island Railroad has a large list out. The Illinois Central Railroad is inquiring for a large line of machine tools, and the Western Steel Company, a subsidiary of the International Harvester Company, has bought $100,000 worth of power equipment. The second-hand tool demand in Chicago is in excess of the supply. An equally good demand exists in Detroit, where automobile manufacturers are buying liberally. In Cleveland a single tool business is being done, but inquiries give promise of a better business. Proposed additions to existing plants are occupying the attention of New England machinery men, but trade there seems to be holding back. The bulk of recent orders in Philadelphia has been for small equipment, and in that market, as well as in New York, conditions are somewhat unsettled, and buyers are demanding price concessions. Mexican troubles are causing some difficulties in transacting business in Texas, especially in the border cities. Export trade continues excellent. In Detroit machine tool makers have booked large orders for Australia and some good European trade has been placed in New York.

New York

NEW YORK, March 29, 1911.

The machinery outlook is more promising than it was a week ago, although buyers continue slow in closing orders for equipment on which they have inquiries out. A number of new propositions that will call for heavy expenditures for machine tools came up during the week and some very good business is in sight. The railroads are slow in purchasing, although the Long Island Railroad has been asking for bids for a few single tools. The company has no list out, and its inquiries are largely for special machinery. While people who deal in a general line of machinery are complaining, many who specialize on automatics or certain lines of metal working machinery, such as presses of special types or forging machinery, are doing a good business. Manufacturers of power equipment and transmission machinery are also getting good inquiries, and the mill supply business is especially good. Something of a lull exists in the foundry trade, and those who make a specialty of machinery castings are complaining. They state that machinery manufacturers show a reluctance to order for stock, and machine tool people, who are ordinarily good customers in this line, show a desire to wait until that market becomes more settled before placing orders.

The Saurer Motor Company, which has been organized with an authorized capital of $1,600,000 to build Saurer industrial trucks, now made in Switzerland and England, has taken over the plant of the Quincy-Manchester-Sargent Company at Plainfield, N. J., and will shortly buy a large line of machinery to install in extensive additions now under way. The company is building a machine shop, 75 x 125 ft.; an assembling department, 75 x 100 ft., and other structures. The company has sent out inquiries for some of the required machine tools. It is understood that further additions to the plant will be made later on, and it is probable that a manufacturing plant will be established in the West. Salesrooms have been opened at 30 Church street, New York.

The Cameron Engineering Company, 156 Berriman street, Brooklyn, has purchased a good sized tract of land at Washington, N. J., along the line of the Lackawanna Railroad, and the company's plant will be moved from Brooklyn to Washington as soon as buildings are erected. The company is moving to Washington because of the growth of its business, and two steel construction buildings erected will be 40 x 80 ft. and 40 x 96 ft. The company's property admits of further enlargement as the business grows. It will be several months before the new structures are erected, and the matter of arranging for additional manufacturing equipment will not be taken up for some time.

The Papyrus Artificial Paper Company, 118 Madison street, Hoboken, N. J., with New York offices at 123 Liberty street, is building a plant, 50 x 150 ft., at Kenilworth, N. J. The structure will be two stories, and at the completion of the building its present manufacturing equipment in Hoboken will be moved there and other machinery will be added. More buildings will be erected as they are needed. The company will purchase its power from the Public Service Corporation of New Jersey. In addition to making crepe paper, the concern makes a rope composed of wire and paper, which serves the same purpose as ordinary cordage.

The United States Metal Products Company, which was recently formed through a combination of the John W. Rapp Company and the J. F. Blanchard Company, manufacturers of metal doors and window frames, has plans under way for the erection of an addition to the Rapp plant at College Point, L. I. The plans include the erection of a shop 250 x 650 ft., of steel construction, with saw-tooth roof; a dock 75 x 900 ft., and an employees' bathhouse 60 x 70 ft.

Franklin B. Ware, State Architect, will receive bids at Albany, N. Y., April 20, for equipment for the Capitol power house. Separate propositions will be received on the necessary steam power and electrical equipment. Specifications can be obtained at the office of Nygren, Tenney & Ohmes, 87 Nassau street, or C. E. Knox, 76 William street, New York, who are the consulting engineers.

The Craig Engineering Company, manufacturer of marine engines, has recently erected a large plant at Jersey City, near Arlington station, and is now buying machinery. The plant includes a machine shop 80 x 180 ft., and it will be devoted to the manufacture of modern marine engines, pumping apparatus, &c.

C. S. Myers, manufacturer of drill presses, bench grinders, &c., at Columbia, Pa., has been placing orders in this market for equipment to be installed in a new addition to his plant which will be 50 x 100 ft.; the building will be used for machine shop purposes.

A number of New York machinery houses have booked large orders from the Nova Scotia Car Company, Ltd., of Halifax, N. S., which is placing large orders for car equipment to be installed in its recently enlarged plant.

The Long Island Railroad Company will shortly buy against a fair sized list of machinery which is to be installed in existing shops. The requirements include machine tools and blacksmith shop equipment.

J. J. Flynn, Jr., who is well known in the East as a machinery salesman, has entered the steel, machinery and supply business with an office and warehouse at 25 Bridge street, Brooklyn. In addition to handling tool steel, structural steel and forgings, Mr. Flynn has the Brooklyn agency for the O. K. tool holders and a line of high speed drills, grinders and buffing machinery. He will also handle a general line of mill supplies.

The Frontier Meter Works has been incorporated at Buffalo to take over and continue the business heretofore conducted under the same trade name by Chas. J. Smith. The manufacturing plant will remain at 44 Henry street, and the company's principal specialty will be the manufacture of improved gas meters under patents which it controls. The incorporators are Charles J. Smith, president and manager; Clinton K. De Groat and Omer E. McNamara.

The Commissioner of Public Works, Buffalo, Francis G. Ward, Municipal Building, will receive sealed proposals until 11 a.m., April 7, for furnishing and erecting a completed feed water heating and purifying system for the water works pumping station, foot of Massachusetts avenue.

The plant of the Vacuum Oil Works of the Standard Oil Company, at Olean, N. Y., was damaged by fire to the amount of $200,000 on March 25.

The American Railway Supply Company, Tracy Fox, president, Westfield, N. Y., has completed arrangements to remove its plant for the manufacture of locomotive parts

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and supplies from Westfield to Conneaut, Ohio, where it will erect a brick building, 60 x 100 ft., on a site offered by the city.

The New Process Stone Company, Syracuse, N. Y., will erect and equip a manufacturing building, 70 x 118 ft., concrete block construction.

The Syracuse Chilled Plow Company, Syracuse, N. Y., will add a six-story and basement brick and steel warehouse, 41 x 92 x 213 ft., to its plant on Marcellus street. It will be connected with the main factory by an overhead bridge.

The capital stock of the Pneumelectric Machine Company, Syracuse, has been increased from $500,000 to $650,000, the increase in capital to be used for the expansion of the company's business and to provide a new factory building and equipment.

Contract has been let by the Rome Brass & Copper Company, Rome, N. Y., for construction of the new tube mill, 115 x 450 ft., it is to erect at East Rome at a cost of $160,000; also for its new office building at Dominick and Bouck streets, Rome, to cost $20,000.

The New York State Casting Company has recently been incorporated at Syracuse, N. Y., to manufacture aluminum, brass and high grade gray iron castings. The new company will occupy a large part of the plant of the Syracuse Stove Works, which will be enlarged to provide the space required. Francis Kernan, president of the Syracuse Stove Works; Edward Joy of Syracuse, and J. D. Rhodes of Pittsburgh, president of the National Car Wheel Company, compose the executive committee of the new company.

Commissioner of Public Works Francis G. Ward, Buffalo, N. Y., is receiving bids for the furnishing and erection of a 40-ton, 3-grate refuse destructor, with accessories, to be installed at the city refuse incineration plant at Hamburg and Scott streets.

Catalogues Wanted

The Union Iron Works, Hill and Burnett streets, Houston, Texas, desires catalogues of field boilers and engines with a view to making agency connections, and not feed boilers as was stated in *The Iron Age* of March 16.

Chicago

CHICAGO, ILL., March 28, 1911.

Conditions are somewhat improved in the local machinery market. Actuated by the attendance at the Railway Appliance Show which was held last week in the Coliseum, and further improved by liberal purchases from the leading farm machinery interest, machine tool business is better. The Northwestern Railway is out with a list approximating $12,000 and the Rock Island with one amounting to nearly the same. The Illinois Central is asking estimates on a quantity of machine tools that will probably total $10,000. The International Harvester Company has been a liberal purchaser throughout the week, the aggregate of its machine tool investment being $50,000. These tools went to the McCormick, Deering and Auburn plants. The Wisconsin Steel Company, a subsidiary of the International Harvester Company, has purchased about $100,000 worth of boilers, engines, generators and locomotives for its coal operations at Yowell, Ky., and a liberal purchase of boilers, engines and generators has also been made for the Harvester Company's plant at Auburn, N. Y. Floor sales in local machinery houses have slightly improved, emanating largely from city repair shops. A greater activity is also noted in purchases from country machine shops. The improvement in this week's market has been very welcome as business had not been up to normal for some weeks. The demand for good second-hand tools continues to be considerably in excess of supply.

The Osborn High Pressure Joint & Valve Company, Chicago, states that the recent increase in its capital stock from $200,000 to $300,000 is for the general extension of its business and that it does not contemplate at the present time any new construction or the installation of new equipment. The question of enlarging its plant will be taken up at the next meeting of the directors of the Steger & Sons' Piano Mfg. Company, Chicago. The various sites offered by different cities will be given full consideration at that time.

The Great Lakes Mfg. Company, North Chicago, Ill., manufacturer of hardware specialties, is rebuilding its plant which was destroyed by fire some time ago and expects to have it ready for occupancy within a short time.

The citizens of Rockford, Ill., will soon vote on $200,000 bond issue for installation of water works system.

Anna, Ill., has plans completed for a water works system to be constructed at an estimated cost of $6500.

The Farmington Light & Power Company, Farmington, Ill., has been incorporated with a capital stock of $30,000. The incorporators are Theo. Bass, M. M. Anderson, H. E. Worden and A. L. Thompson.

The Superior Foundry & Mfg. Company, Belleville, Ill., has been incorporated with a capital stock of $5000. The incorporators are Oscar Welker, John Hanwar and William M. Hoppe.

The Alton Gas & Electric Company, Alton, Ill., has increased its capital stock from $500,000 to $600,000.

J. A. Meyer, former president and manager of the Galva Gas Company, Galva, Ill., is seeking to obtain a gas franchise at Edwardsville, Ill., and will submit a proposition to the City Council April 4.

The Russell Automatic Gas Machine Company, Rockford, Ill., recently incorporated with $150,000 capital stock, will manufacture gas machines vacuum systems and cistern pumps. The company will erect a two-story factory building, 50 x 100 ft., which will be equipped with the necessary machinery for manufacture.

The Board of Public Works of Wauwatosa, Wis., will receive bids until April 1 for one duplex compound steam driven air compressor of 500 gal. per minute capacity and one air receiver or tank for use in its water works plant.

The City Council of Superior, Wis., is planning the installation of a municipal water works system.

Arlington, Minn., is planning the installation of a water works system.

Culbertson, Mont., has plans prepared for a municipal water works system.

The Denver Gas & Electric Company, Denver, Colo., through its Board of Directors, has authorized an issue of $2,500,000 in three years. Improvements and extensions amounting to about $500,000 will be made by the company.

Colorado Springs, Colo., is planning extensive improvements for its water works system.

The Ottumwa-Moline Engine & Pump Company, Ottumwa, Iowa, has its new plant at that place ready for occupancy. The plant is located on a 5-acre site in South Ottumwa, and additional buildings, including office building, engine testing department and tin shop, are in course of erection. A foundry building, 80 x 120 ft., will be erected during the coming summer.

The Kinser Mfg. Company, Sioux City, Iowa, is contemplating the erection of a new factory building. The company has recently increased its capital stock from $25,000 to $50,000, owing to the need of enlarging its facilities for the manufacture of churns.

Reidell & Jensen, Waterloo, Iowa, are planning to largely increase the capacity of their creamery plant, and will shortly commence the work of building a substantial addition.

Philadelphia

PHILADELPHIA, PA., March 27, 1911.

There is still an absence of any pronounced inquiry for either machinery or tools. Manufacturers and merchants are competing sharply for the little business offering and in some few instances price concessions are reported to have been made. Even under such conditions there has not been business to go around. The bulk of the recent orders has been for small equipment, although an occasional heavy tool is moved. Few propositions embracing any extensive equipment of tools are before the trade; negotiations are pending in one or more instances, but prospective buyers appear to be in no haste to place orders. This market is still bare of any demand for tools from the local railroads, although a few orders from railroads in other territories have been booked by some of our builders. Until the general business situation shows an actual improvement the demand for machinery and tools is expected to continue of an unimportant nature.

The Philadelphia Iron Works has purchased additional property at Eighteenth street and Pennsylvania avenue, and will erect a new office building and other additions, and will lengthen its boiler shop by 100 ft.; the latter improvement will, however, not be completed for several months. This company's plant was recently damaged by fire and the proposed additions are in the nature of replacements and extensions to its previous plant. Additional machinery equipment will be required for the boiler shop extension, but the purchase will not be considered for several months.

On application of its own stockholders the Keller Mfg. Company, manufacturer of vacuum cleaning apparatus, Judge Holland, in the United States Circuit Court, last week appointed Howard Small, H. H. Light and Charles A. Duven receivers. The company is a Delaware corporation,

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and the petition for receivers alleges that the lack of working capital has impaired the company's credit. The plant is to be operated by the receivers, and it is stated that its assets are more than sufficient to meet all its liabilities. The receivers' bond was fixed at $50,000.

Horace E. Campbell will sell at receiver's sale the property of Yeager & Hunter, Spring City Stove Works, Spring City, Pa. The patterns, flasks and all other equipment are to be included in the sale. The plant has a capacity of 25 tons a day and floor space for 62 molders.

The Baldwin Locomotive Works has received orders for 40 engines from the Illinois Central Railroad and six freight engines from the Georgia Central. The company denies the report that it will erect an additional boiler shop at Eddystone, Pa.

It is stated that the plant of the Union Saw Mfg. Company, Frackville, Pa., now idle, will be started at an early date. George W. Hoffman is president and William Teeter secretary.

The Belmont Iron Works has the contract to erect the buildings for the new plant of the Herr Automatic Press Company at Ambler, Pa. It also has contracts for the erection of several buildings for the American Agricultural Chemical Company at Point Breeze, as well as a number of small buildings in this city. Other orders secured are for a warehouse, 150 x 280 ft., for the American Sugar Refining Company at Long Island City, N. Y.; an addition for the Gandy Belting Company, Baltimore, Md., and a power house for the Edison Company near Los Angeles, Cal. It is also fabricating several car sheds for export to Cuba.

Revised plans for the widening of Chestnut Street Bridge, in this city, have been practically completed and the Bureau of Surveys will shortly ask for new bids under the revised plans. Under the original plans the bids exceeded the sum available.

Bids will be received until April 4 by the Navy Department for a quantity of supplies to be furnished the League Island Navy Yard, in this city. These include, under schedule 3395, a sand mixer and grinder; schedule 3397, furnishing and installing brick mold drying and core oven, also crucible steel fuel oil furnace; schedule 3426, stud bolts, sheet brass and copper, brass pipe; schedule 3427, wrought iron and steel pipe. Specifications may be obtained from the Navy Pay Office, Philadelphia, or on application to the bureau.

The Pennsylvania Railroad will erect at Dover, Del., a large railroad station, the contract for which has just been awarded to Irwin & Leighton, Philadelphia. The train platforms will be 500 ft. long and will be connected by a concrete passenger subway. The building will be two stories, the upper floor being used as offices for the officials and directors of the Delaware Railroad Company.

The American Die & Tool Company, Reading, Pa., is busy in all its various departments and considers the prospects for continued activity exceedingly good. This company has recently completed alterations whereby 10,000 sq. ft. of floor space has been added to its plant. Additional equipment for the manufacture of dies, reamers and gears has been installed and the former capacity of the plant doubled. This company makes a specialty of hardened steel spur gears up to 36 in. diameter.

J. G. Speidel, Reading, Pa., reports an increased demand for elevators, cranes and hoists. The plant is being operated at full capacity and the outlook for business is considered favorable. Among recent orders booked may be mentioned one from the Foundries Company, Orrville, Ohio, for a 3-ton double I-beam hand power crane, 36 ft. 5 in. span. The Tampa Foundry & Machine Company, Tampa, Fla., has ordered a 6-ton 49-ft. span double I-beam hand power crane. A 15-ton double geared I-beam hand power traveling crane, 31-ft. span, will be furnished the National Electrolytic Company, Niagara Falls, N. Y., while one of the same capacity, but 32 ft. 6 in. span, will be furnished A. Gonsoulins, Loreauville, La. Other orders include cranes for the Star Granite Company, St. Johnsbury, Vt.; Maurice L. Knight, Baltimore, Md.; E. P. Anderson, Circleville, Ohio, and the Golding Mfg. Company, Franklin, Mass. Three belt power elevator machines have also been ordered by the L. V. Roberts Machine Company, San Francisco, Cal.

Cincinnati

CINCINNATI, OHIO, March 28, 1911.

In comparison with February, March has proved to be a rather unsatisfactory month with a number of manufacturers in this territory. In the first named month there was quite a spurt of activity in the machine tool line, and it was expected that March would bring out a still larger volume of orders. While inquiries are numerous the trade is holding off placing orders, and this is attributed to the uncertainty as to the court decisions on the anti-trust question. In the privately expressed opinion of a local manufacturer there is probably a little too much optimism in some circles, and as a consequence large additions to plants are being made, or are contemplated, which means the accumulating of an abnormal overhead expense that must be taken care of. This does not imply that the outlook is not encouraging, but, on the contrary, if one-half the machinery was bought that is now being inquired for it would mean something like the boom period of 1907.

Power plant equipment is moving slowly, although there are several municipal water work plants planned for the Central West this summer.

The Lodge & Shipley Machine Tool Company, Cincinnati, has decided to extend its main shop, and plans are now in the hands of an architect for a building that will be 70 x 100 ft., one story, and of mill construction. Work is expected to commence before the beginning of summer.

As was announced several weeks since, work on the new plant for the United States Electrical Tool Company, Cincinnati, has been resumed, and progress now being made would indicate that the company will be able to occupy the new factory at a date earlier than was anticipated.

The new plant of the Incandescent Light & Stove Company at Oakley, Cincinnati, is nearing completion, and the company expects to have it in full operation before the middle of the summer season.

The William Powell Company, Cincinnati, manufacturer of valves and other engineering specialties, sustained a fire loss to its foundry March 23 estimated around $15,000. Repairs were immediately begun and no delay in shipments will result. The loss was fully covered by insurance.

The Queen City Punch & Shear Company, Cincinnati, now has all of its machinery installed in the old Bickford Tool Company plant. The new quarters will enable the company to considerably increase its output.

Work on the addition to the piano factory of the Baldwin Company, Cincinnati, will be commenced at an early date. The new structure will be 80 x 144 ft., four stories, and of mill construction. This project was mentioned some time ago as having been temporarily abandoned.

It is reported that the Riverside Glass Company's factory at Willsburg, W. Va., which has been idle since 1907, has been leased by a company that will operate it as a brass foundry, under the name of the Forest City Brass Company.

The Rebhun Last Company, Evanston, Cincinnati suburb, has let contract to Bert L. Baldwin & Co., Perin Building, Cincinnati, for two extensions to its main factory building and for an enlargement of its power plant. Some new power plant equipment will be installed, as well as special machinery for the manufacture of shoe lasts.

Architect Martin Fisher, 2156 Central avenue, Cincinnati, is working on plans for an addition to the boiler house of the Lawrenceburg Roller Mill Company, Lawrenceburg, Ind.

Bert L. Baldwin & Co., Cincinnati contractors, have contract for building a large plant at Chatham, Ont., for the American Pad & Textile Company, Greenfield, Ohio.

It is reported that the Morgantown & Kingwood Railway Company, Morgantown, W. Va., has let contract for rebuilding its large repair shops at that point that were recently destroyed by fire.

The Foos Gas Engine Company, Springfield, Ohio, which is considering the erection of extensive additions to its present plant, states that plans regarding the buildings to be erected or the equipment to be installed have not been definitely decided upon.

The Water Works Department, Cincinnati, Ohio, will soon ask for bids for the construction of a sterilization plant at the California filtration works, at a cost not to exceed $6500; two water turbines with electric generators, approximate cost $5500, and two wash water pumps at $6000.

New England

BOSTON, MASS., March 27, 1911.

While the machine tool and supply dealers are doing a fair business there is still a drag on the situation which is holding back general buying. Business is not so good as was hoped for with the approach of April, but at the same time it is by no means a really dull condition, and the March footings on the dealers' books should show a comfortable amount of profit. Apparently the New England railroads are confining their threatened curtailments to their working forces. Men have been laid off in some of the New York, New Haven & Hartford and New York Central shops, but nothing has been heard to indicate that planned improvements have been abandoned or postponed. The hardware manufacturers are doing a very good business; probably their condition is fully normal. The record of new

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manufacturing building construction continues to grow. Naturally the expansion of the cotton mills is slow, as compared to last year, when building operations ran into many millions of dollars. But in the metal trades the expansion appears to be healthful and satisfactory.

George O. Gridley, manager of the Windsor Machine Company, Windsor, Vt., manufacturer of the Gridley automatics, sailed March 22 from New York, for a short business trip in Europe.

Charles F. Underwood has been made New England sales agent for the department of power transmission of William Sellers & Co., Inc., Philadelphia, with offices at 79 Milk street. Mr. Underwood has been with the Dodge Mfg. Company for 15 years.

The recent incorporation of the Dairy Machinery & Construction Company, Derby, Conn., under Connecticut laws, is merely a transfer of the charter from New Jersey to the home State. The business has been established for some years. J. Willmann is the president.

The Farnham Cam Jack Company, Rumford, Maine, is organizing, and will immediately establish a shop for the manufacture of a new jack for lifting heavy bodies, such as railroad cars, and for other mechanisms having adaptations of the same principle. The device is the invention of Fred E. Farnham, Rumford. By the use of a combination of gearing with the cam principle a very powerful lifting force is obtained with the application of a small amount of energy. The shop will also be used for general machine work.

A large addition to the capital stock of the Clark Bros. Bolt Company, Milldale, Conn., was simply authority obtained, which may or may not be used in the future, the company states.

C. L. Barker, Norwalk, Conn., who will erect an addition to his shop, 30 x 130 ft., manufactures the Barker gas engine, the Murray motor truck, together with launches, valves and fittings.

The business of the Lester & Wasley Company, Norwich, Conn., manufacturer of envelope machinery, has been incorporated as a result of the death of the owners, D. M. Lester and F. R. Wasley. The business will be known as the Lester & Wasley Company, Inc., and will commence business with $17,000 capital. F. W. Lester is the president; H. L. Stanton, vice-president; F. H. Allen, secretary; Percival W. Chapman, treasurer and manager, and George W. Armstrong, superintendent. These officers constitute the Board of Directors. No extension of the business is planned for the immediate future, but the company hopes to take on the manufacture of other light machinery in addition to the Leader envelope machine.

The Meriden Fire Arms Company, Meriden, Conn., which is building a large addition to its works, states that while its new toolroom is already equipped the company is still purchasing machinery and tools, and will probably continue to be in the market, though not to so great an extent as recently.

The factory of the Cohannet Silver Company, Taunton, Mass., manufacturer of silver plated ware, was burned with its contents March 22, with an estimated loss of $20,000.

The Philadelphia & Reading Coal Company will build a modern coal pocket at its dock, Salem, Mass., with a capacity of 1000 tons.

The Spencer Wire Company, Worcester, Mass., will erect an addition to its works at Worcester, 80 x 400 ft., three stories. It will be located on Webster street, and will be of brick, mill construction, with concrete foundation. The purpose is to increase the general manufacturing capacity of the plant. Probably the flat wire department will be moved into the new building, releasing space in another part of the plant. The company states that it will probably purchase the electric power for operating the machinery of the building from the local power company, instead of increasing the power plant.

The Water Commissioners of Middletown, Conn., will erect a building in which a small repair shop will be located.

The Wyman & Gordon Company, Worcester, Mass., manufacturer of drop forgings, has purchased several lots of land adjacent to the present property, in preparation for future enlargements of the works.

The Gilbert & Bennett Mfg. Company, Georgetown, Conn., manufacturer of wire, has started work on two new manufacturing buildings.

The General Electric Company will erect a large office building for its works at Pittsfield, Mass.

The L. W. Pond Foundry & Machine Company, Worcester, Mass., manufacturer of gray iron castings, has let the contract for its new foundry, which has already been mentioned in this column. The structure will be 66 x 261 ft., and will have the most modern foundry equipment.

Additions to general manufacturing plants of New England include the following: Wachusett Thread Company, Worcester, Mass., mill building; Farr Alpaca Company, Holyoke, Mass., two-story mill to cost $150,000; Sanitary Cement Company, Everett, Mass., proposed addition on land just acquired.

Cleveland

CLEVELAND, OHIO, March 28, 1911.

Very few new inquiries are reported and the limited amount of new business that is coming out is mostly in single tool orders. Taken altogether March has been rather a disappointing month. Some of the dealers report that their total sales will run a little below those in February. New orders are of a scattering nature, coming mostly from small concerns. Considerable prospective business from larger concerns is being held up until general business shows further improvement. For the first time in a number of weeks there is an improvement in the demand for labor from manufacturing plants. Quite a few additional men have been put on during the past few days, mostly in plants engaged in the automobile industry. Makers of automobile parts are getting a fair volume of orders but these are mostly for small lots for quick shipment.

The Cleveland Wire Goods Company, Cleveland, has increased its capital stock from $25,000 to $50,000.

Cleveland crane builders are striving for an important government contract for an installation in Panama, for which bids will be received shortly. This will be for eight motor-driven traveling wharf cranes for loading and unloading vessels and freight cars. It was recently announced that this contract had been awarded to a northern Ohio builder. Later the War Department gave the matter further consideration and decided to reject all proposals and to receive new bids.

The Standard Oil Company will erect a large can factory in Cleveland. The new plant will consist of two two-story concrete buildings 70 x 300 ft. and a boiler house. A large amount of special machinery will be installed. Some power plant equipment will also be required. The contract for the building has been awarded to the Crowell & Sherman Company, Cleveland.

The Architectural Iron Company, Cleveland, has been incorporated with a capital stock of $25,000 to do light structural work and manufacture ornamental iron, bronze and brass work. The new company will take over the plant of the H. & H. Art Metal & Mfg. Company at 827 Champlain avenue but will secure a new location providing more room. R. A. Barrett will be the manager.

The Ohio Electric Car Company, Toledo, Ohio, has increased its capital stock from $150,000 to $250,000 to provide for its expansion. Contracts for its new plant have been let to the A. Bentley & Sons Company of Toledo. It is expected that the plant will be ready for occupancy May 15.

The Bowling Green Motor Car Company recently incorporated at Bowling Green, Ohio, with $100,000 capital stock, has purchased an existing plant and is not contemplating the erection of any additional buildings. All necessary machinery has been purchased.

The M. Brown Company, Wapakoneta, Ohio, has increased its capital stock from $40,000 to $60,000 and has taken over the business of the Snyder Mfg. Company of that city, manufacturer of mill work and furniture. The company will erect a first-class saw mill and furniture factory and enlarge its capacity, for the purpose of manufacturing sash, doors and builders' hardware.

The Acklin Stamping Company, Toledo, Ohio, has been organized with a capital stock of $50,000 and has acquired a site on Dorr street on which a plant will be erected for the manufacture of metal stampings. Graff M. Acklin, formerly secretary-treasurer of the Toledo Machine & Tool Company, will be the president, having disposed of his interest in the company with which he has been connected. The new plant will be in charge of Mr. Acklin's two sons, James M. and Collard Acklin, and Jeremiah Bingham.

The Wooliever Wrench Company has secured a site in Alliance, Ohio, and expects shortly to begin the erection of a plant for the manufacture of a new wrench designed for various purposes. The plant will be 50 x 100 ft. and one story. The company has its main office at 417 Engineers Building, Cleveland. The officers are W. A. Wooliever, president; John D. Ackerman, vice-president; and W. H. Burnett, secretary.

The Dyer Company, Cleveland, engineer and contractor, has recently received contracts for three beet-sugar making plants, one at Findley, Ohio, with a daily capacity of 700 tons of beets, one at Monte Vista, Colo., with a daily capacity of 700 tons, and one at Elsinore, Utah, with a capacity of 500 tons. The Dyer Company is completing ship-

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ments on a cane sugar plant with 500 tons capacity on the island of Formosa.

The Beard-Stephan Company, Columbiana, Ohio, recently incorporated with a capital stock of $10,000, expects to equip a small plant for the manufacture of a patent crane hook, the invention of W. G. Stephan of Cleveland, and other safety devices.

Elyria, Ohio, will expend $50,000 for improvements to its water works system.

Indianapolis

INDIANAPOLIS, IND., March 28, 1911.

Harry Moore, superintendent of the National Motor Vehicle Company, Indianapolis, Ind., and G. Shaw of the same city are promoting the Star Automobile Company, Logansport, Ind. It is reported that enough stock has been sold to assure the establishment of a plant, probably in the buildings formerly occupied by the Western Motor Works.

The Elevator Safeguards Company, Indianapolis, has been incorporated, with $50,000 capital stock, to manufacture safety appliances for elevators. The directors are George Harvey, E. S. Padelford and C. W. Habig.

The Link-Belt Company, Indianapolis, has just completed a new building, 96 x 155 ft., an addition to its large plant. It has three floors and 39,000 sq. ft. of space. The building is fireproof.

The Berger Mfg. Company, Canton, Ohio, secured the contract for the metal furniture for the new City Hall at Indianapolis, its bid being $14,463.

A. D. Toner's handle factory, Kewanna, Ind., has been sold to Henry Howe and Hugh Cook and will be operated after an idleness of several years.

The Southern Equipment Supply Company, Bedford, Ind., has been incorporated, with $10,000 capital stock, to manufacture equipment for quarries. The directors are H. P. Stillwell, C. B. Fletcher and F. Riebel, Jr.

The Blackford Paper Mills has been incorporated at Hartford City, Ind., with $265,000 capital stock, to manufacture paper products. The directors are Henry C. Paul, H. J. Miller, Louis Fox, M. B. Fisher and P. F. Griffin.

The Brazil Face Brick Company, Brazil, Ind., has been incorporated, with $60,000 capital stock, to manufacture brick and clay products. The directors are George Seidensticker, F. Gompf and F. M. Thompson.

The Logansport Radiator Works, Logansport, Ind., has plans drawn for a steel frame fireproof addition, 100 x 110 ft., to its plant. This will double the capacity of the plant.

The City Council of Richmond, Ind., has appropriated $10,000 for a new engine for the municipal electric light plant.

The plant of the Westerfield Motor Company, Anderson, Ind., was sold by the receiver to Mrs. J. L. Kilgore and Mrs. Maud Norton, both of whom had a judgment against the company.

The Cement Products Company has been organized at Worthington, Ind., to manufacture cement products. The directors are F. M. Dugger, James Hodges and Fred Slinkard.

F. L. Kleckner, representing the Aurora Electrical Company, Aurora, Ill., has secured a franchise from the Town Trustees of Francesville, Ind., for an electric light plant. It is proposed to build a gas generating plant to operate the dynamos.

The Service Motor Company, Chicago, Ill., has sold $40,000 of stock in Wabash, Ind., and will establish a plant in the buildings formerly occupied by the iron and bridge works. The company will operate under $100,000 capital stock. It makes trucks and various kinds of commercial wagons.

The Sefton Mfg. Company, Anderson, Ind., will build a factory at Brooklyn, N. Y., to handle the Eastern trade. It will be under the management of William J. Sharp, from the home office. The chief product of the company is paper boxes.

The City Council of Brazil, Ind., will hold an election to decide whether a municipal electric light plant shall be installed.

The American Insulating Company, Alexandria, Ind., has been incorporated, with $600,000 capital stock. It will take over the interest of the American Insulating Material Mfg. Company. The directors are F. K., F. O. and J. L. Sawyer, C. L. Bayne, G. B. Slaymaker, F. M. White and J. H. Boogher.

The Underhill Brick & Tile Company, Rockport, Ind., has been incorporated, with $24,000 capital stock, to manufacture brick and tile. The directors are M. F. and C. B. Underhill, J. G. Rimstidt, C. C. Mason and G. J. Bence.

The Southern Equipment & Supply Company, Bedford, Ind., recently incorporated, states it was organized for the purpose of assisting in the development of the Bedford Stone district. The company will handle general construction work, with particular attention to electrical construction and maintenance and the application of electrical drive to quarrying and mill machinery. A full line of mill supplies, both electrical and mechanical, will be carried in stock.

The City Carriage Works, Fort Wayne, Ind., incorporated with $20,000 capital stock, has taken over the plant of the old City Carriage Works, established in 1875.

The Globe Stove & Range Company, Kokomo, Ind., states that the recent increase in its capital stock from $250,000 to $500,000 is for extensions to its plant. The plans of the company embrace a new factory building, 180 x 260 ft., and a storage building, 80 x 400 ft., both to be of concrete and steel fireproof construction. The company will be in the market for roofing, grinding, drilling and polishing machinery, shafting, hangers, belting, elevators, cupola blower, &c.

St. Louis

ST. LOUIS, MO., March 27, 1911.

Business during the past week in machine tool lines has been rather quiet, though some fair orders have been picked up. The usual spring buying has not yet put in an appearance in this market, though visitors from out of town can be expected soon now, as new shop projects, especially the smaller ones, usually take definite shape about this time.

The Bowman-Blackman Machine Tool Company mentions the sale of a heavy Cleveland open side planer to the Government for use in the local shops.

Shops here are much interested in the completion of the extensive new freight yards of the Illinois Electric Traction System in North St. Louis. These yards comprise an area of 24 acres and will much facilitate the quick handling of carload freight over this large and progressive electric system. St. Louis now enjoys overnight deliveries of freight to the numerous points in Illinois on this company's 600 miles of lines.

The Ludlow-Saylor Wire Company, St. Louis, has increased its capital stock from $500,000 to $600,000.

The Spring Pipe Threader Mfg. Company, St. Louis, has been incorporated, with a capital stock of $50,000. The incorporators are A. Gibbard, A. Brandherst and M. Whittinghoff.

The Hempstead Structural Steel Company, St. Louis, has been incorporated, with a capital stock, fully paid, of $15,000. The incorporators are Edward A. Beinke, Ernest J. Moser and F. L. Beinke.

The Kalamazoo Corset Company, Kalamazoo, Mich., will establish at St. Louis a branch factory in the West End. The buildings will be two five-story structures and the company will employ about 500 people.

R. A. Boyle will build a girder bridge for a switch to cross Duncan street, St. Louis.

The Board of Public Improvements has plans prepared for the abolition of the Sarah street grade crossing of the Wabash Railroad, which call for a viaduct over the railroad tracks.

An explosion of unknown origin wrecked the Herkert & Meisel Trunk Company's factory on North Market street and the plant was destroyed by fire, causing a loss of $62,000.

The Robinson Fire Apparatus Company has purchased the corner of Twentieth and Ferry streets for $30,000. The company manufactures automobile fire engines, and it is understood will enlarge its present quarters on the site.

The Bemis Bros. Bag Company has taken out a permit for an eight-story warehouse at 601-605 South Fourth street, to cost $55,000.

The factory of the Brown, Engel & Olean Paper Box Company was partially destroyed by fire March 25. The machinery in the place was worth $10,000. On this the loss will be only partial.

A company has been organized at Chaffee, Mo., for the purpose of carrying on the ice business and a plant will be installed at once. The officers of the company are as follows: President, J. S. Wahl; vice-president, Wm. Pfefferkorn; secretary and treasurer, W. H. Brooks; manager, D. C. Shoptaugh.

The County Court, Rolla, Mo., has ordered the Highway Engineer to advertise for bids for the construction of a bridge to span Little Piney just south of Newburg, Mo.

The Home Lumber & Shingle Mfg. Company, Caruthersville, Mo., has been incorporated, with a capital stock of $5000. The incorporators are J. S. N. Farquer, C. S. Reynolds and D. A. Hitchcock.

The Kansas City Scales Company, Kansas City, Mo., has been incorporated, with a capital stock of $10,000. The incorporators are F. M. Cockrell, R. I. Merrill, E. J. Spencer and others.

The city of Elvins, Mo., will shortly receive bids for the erection of a steel bridge across Flat River.

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The saw and shingle mill plant of the Freeman Lumber Company at Gleason, Ark., was destroyed by fire March 15, causing a loss of $50,000. The plant was one of the largest in central Arkansas and probably will be rebuilt, as the company holds timber rights on a large tract of land.

A. P. Kincaid, Paris, Ark., will erect at Scranton, Ark., a cotton gin, to cost upward of $10,000. The Pratt automatic system will be used.

A company headed by J. J. Russell will erect near Forrest City, Ark., a large stove factory at the junction of the Rock Island and Iron Mountain railroads.

The Brown Shoe Company, St. Louis, Mo., which is erecting a new factory building, 49 x 150 ft., seven stories and basement, to be connected with its present factory by a 60-ft. ell, states that the building will be equipped with automatic sprinklers and two 350-hp. boilers. A new reinforced concrete stock, 146 ft. high, is also being erected.

The United States Steel Doubletree Company, Rolla, Mo., incorporated with $20,000 capital stock, states that it owns a plant at Sullivan, Mo., and expects to continue the operation of its plant there for the present.

The City Council of Siloam Springs, Ark., has voted to expend $5000 for new machinery to be installed in the electric light plant for the establishment of a 24-hour service.

The Roswell Gas & Electric Company, Roswell, N. M., is rebuilding its electric power plant, in order to supply power to the different pumping irrigation projects in the Pecos Valley.

Mulberry, Kan., will expend $8000 for improvements to its water works system.

The Hollis Cotton Oil, Light & Ice Company, Hollis, Okla., recently incorporated with $75,000 capital stock, states that it has already contracted for building and machinery for the plant which it is installing at Hollis.

The Eagle Mfg. Company, Kansas City, Mo., is planning the erection of a plant at Muskogee, Okla. The company will move its machinery from its present plant about July 1. Considerable additional equipment will be required. A. C. Trumbo is president of the company.

Detroit

DETROIT, MICH., March 27, 1911.

March on the whole has been a remarkable month in point of shipments and orders. The spring trade would naturally be very good, but March has been exceptionally so. More orders for motor cars have been received than for any other month of the past year. The General Motors Company is authority for the statement that all its output for this year has been contracted for already. A great deal of foreign trade has been opened up and Australia has been an excellent market this spring for Detroit manufacturers. Some apprehension has been voiced by outsiders as to overproduction. The head of the Paige-Detroit Motor Car Company, however, states that there is no cause for such a feeling, as he believes the demand is in excess of the production.

The Clyde Construction Company has increased its capital stock from $52,000 to $130,000. The company will make use of the capital for increasing its capacity.

The Dispatch Laundry Company has increased its capital stock from $5000 to $20,000 with the view of more than doubling the size of the plant.

Nearly every week finds a new motor car concern entering the city's automobile ranks. This week the Wayne Motor Company incorporated with a capital stock of $30,000. Walter H. Woods of Ann Arbor is the principal stockholder.

A new auto accessory company is the Michigan Steering Wheel Company of this city. It has a capital stock of $7000. Eugene A. Bresler is one of the principals.

The Northway Motor Company is starting the construction of a large addition to the plant in the way of a new foundry.

W. M. Eaton of New York and J. B. Foot of Jackson, both officials of the Au Sable Power Company, made a trip this week to Milwaukee, Mich., where they inspected a site for the sub-station of the Au Sable Company. This transformer station will be operated as an auxiliary to the present power house. The building will be about 70 x 90 ft. and of solid concrete. The heavy machinery will be installed on the ground floor.

The Marshall Furnace Company, Marshall, Mich., has started construction on a new factory.

The Michigan Limestone & Chemical Company, Calcite, Mich., will build a large stone crushing plant this spring. Work will commence this week on the excavations.

Pittman & Dean of this city have let the contract for the erection of a new steel artificial ice plant. The plant will far exceed the capacity of the present factory.

The Hensley Trolley & Mfg. Company has plans completed for the erection of a brick factory addition. The new factory will take care of the crowded quarters.

Montrose Township, Genesee County, will vote this spring on a bonding proposition to cover the cost of construction of two new iron bridges over the Flint River.

St. Charles, Mich., will spend $4000 for a small water works system if the question passes at the spring election.

The Plymouth Motor Car Company is the name of a new automobile concern incorporated in this city. The new company will start business with a capital stock of $20,000.

The Menominee River Sugar Company is making plans for the erection of a new drying plant to cost in the neighborhood of $125,000.

The Continental Motor Company, Muskegon, Mich., has plans laid for a large addition to its present plant. The factory will cost approximately $60,000.

The Kalamazoo Suspender Company, Kalamazoo, Mich., will build a three-story factory this spring to care for its increasing business.

Port Huron, Mich., is to have an aeroplane factory. Business men have become interested with Charles J. Stroebel of Toledo, Ohio, and have organized the Stroebel Aviating Company of Port Huron.

A company has been organized at Grand Rapids, Mich, to make an improved pipe covering. The principals are Glendon A. Richards and I. H. Wilson.

The Combination Brick Company of this city has increased its capital stock from $50,000 to $200,000.

With the idea of increasing the capacity of the plant, the Frost Gear & Machine Company, Jackson, Mich., has increased its capital stock from $100,000 to $150,000.

The John Johnson Company of this city has been organized to deal in and manufacture steam-pipe covers, tents and awnings. The company has a capital stock of $20,000.

A new steel castings company is the Peerless Crucible Steel Castings Company of this city, which has a capital stock of $20,000.

The Gies-Hoyt Mfg. Company with a capital stock of $10,000 has incorporated under the new name of Standard Gear Company.

The Detroit Foundry & Supply Company has made a considerable increase in its capital stock. The amount was raised it from $25,000 to $40,000.

The Creissel Bread Company, Flint, Mich., has incorporated with a capital stock of $75,000. Machinery of the most modern type will be used for the manufacture of all bread products.

Of material importance to Bay City, Mich., is the large increase in the capital stock of the Michigan Turpentine Company. The increase from $120,000 to $500,000 is to allow the construction of a plant nearly three times the size of the present structure.

Two large chemical plants are in process of construction at Luther and Filer City, Mich. Promoters have secured 10,000 acres of stump land and propose to erect plants of considerable importance to the two towns. H. W. Marsh of Manistee is prominently identified with the organization.

The Hanselman Candy Company, Kalamazoo, Mich., is planning a considerable enlargement to its present factory. This spring the company will erect a three-story brick plant adjoining the main structure, intending to enable it to handle its increasing business. The company recently installed a $5000 chocolate coater.

The large plant of the Ideal Motor Company at Lansing, Mich., was completely destroyed by fire March 20. The loss will reach $200,000. The company will rebuild.

The Stebbins & Wilhelm Company, Sturgis, Mich., maker of furniture, will build a four-story factory addition to its Sturgis plant. The building will be of brick and modern mill construction.

The Barnes-Baker Company with a capital stock of $40,000 filed articles of incorporation with the Secretary of State this week. The company will locate its plant at St. Joseph, Mich., and will make a patented folding umbrella.

A new company has been organized at Battle Creek, Mich., under the style of the Battle Creek Box Company, to manufacture boxes. The concern has a capital stock of $10,000.

The W. R. Roach & Co., who have several canning factories about the state, will erect a plant consisting of eight buildings at Scottville, Mich. The buildings will cover 2½ acres of cement foundations.

The Eclipse Motor Company, Cadillac, Mich., will remove its plant to Traverse City. The Board of Trade there has made sufficient inducements to warrant the change which will be accompanied by an enlargement of the plant's capacity.

The Duplex Motor Car Company, Charlotte, Mich., which at first planned to remain at the latter place and make its improvements there, has decided to move to Muskegon. Chicago parties have bought out the Charlotte stockholders,

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and with the added capital it is planned to make considerable improvements.

A bond issue of $125,000 to cover the cost of a new Leonard street bridge, will be voted upon by Grand Rapids, Mich., at the April election. The proposition was favorably acted upon by the council last week.

The Imperial Furniture Company, Grand Rapids, Mich., has commenced construction on a new factory addition to its present plant. Work will be rushed to completion.

The Board of Trade of Grand Rapids, Mich., is planning to establish a $300,000 fund to assist new industries and bring new industries to the city.

W. J. Turner of the Vulcan Brick Works, near Norway, Mich., is planning to install some new labor saving machinery this season. The force of 50 men will be cut to about 40, it is planned, with the new machinery.

The Cadillac Motor Car Company, Cadillac, Mich., has taken over the Monroe Body Company of Monroe for the purpose of giving as much detail to the construction of the body as it is able to give to the parts made under its own supervision.

The E. N. Pudrith Company, manufacturing jeweler, has increased its capital from $50,000 to $75,000.

The John P. Berry Company, sheet metal manufacturer and machinist, has let the contract for a two-story brick factory. The structure will be more than twice the size of the present plant.

The Elliot Machine Company, Grand Rapids, Mich., manufacturer of automatic button attaching machines, stapling and riveting machines and shoe finders' hardware, is seeking a suitable site in that city for the erection of a large factory building. The company is at present operating three different branches in Grand Rapids, all of which will be assembled in the new building when completed. Details regarding engines, boilers, machinery or tools to be installed have not been decided upon as yet.

The City Council of Elsie, Mich., will expend $5000 for the installation of an electric light plant.

The Pere Marquette Railroad Company will construct a 43-stall roundhouse at Grand Rapids, Mich., to be equipped with all modern improvements.

The Continental Motor Mfg. Company, Muskegon, Mich., states that the erection of the addition to its plant for which plans have been prepared has been indefinitely postponed. Detroit is offering strong inducements to the company and it is possible that the plant may be moved to that city.

The South

LOUISVILLE, KY., March 27, 1911.

Little change is noted in the condition of the local machinery market, manufacturers reporting conditions generally quiet. Indicating a peculiarity of the situation, a local boiler plant is working overtime this week on rush orders, although the officers of the company report that little business has been put on the books of late and reduced hours may be put into effect in the next few weeks.

An interesting feature of the industrial outlook in this section is the large number of interurban traction projects which are under consideration. In Kentucky and Tennessee numerous companies are being formed for this purpose, and they are looked to as heavy purchasers of power equipment a little later on.

In addition to improvements of the traction system at Lexington, Ky., recently reported in *The Iron Age*, the Henderson Interurban Company has completed its organization and will build lines from Henderson to Dixon, Ky. The Business Men's Club of Shelbyville, Ky., has taken hold of a plan to build a line to Frankfort, the State capitol, while numerous lines are under consideration at Nashville, Tenn., for construction into nearby territory. Henderson, Tenn., is now discussing a line from that point to Savannah, Tenn., the estimated cost of which is $850,000. William Lea, of Henderson, is the engineer in charge of the preliminary work.

Henry H. Martin, vice-president and general manager of Grainger & Co., structural iron manufacturers, Louisville, has resigned his position, his stock in the company being purchased by W. C. Brohm, who has succeeded to the positions made vacant by Mr. Martin. The latter has not yet decided on his plans for his future work, but will engage in business in Louisville.

The Lincoln Institute, which has secured a large tract of land near Simpsonville, Ky., has let contracts for the erection of eight buildings to the George H. Rommel Company, Louisville. A power house will be built and equipped, as the institute will have its own water works and electric light plant. Equipment for these will be purchased in the near future. In addition some machinery will be required for the manual training department of the school. The institute is to be used for the training of negroes along industrial lines, and has a fund of over $400,000 to draw from, Andrew Carnegie having given $300,000 to the work. W. H. Frost, president of Berea College, at Berea, Ky., is closely in touch with the new institution.

The Lindley Mfg. Company, Louisville, has been incorporated with a capital stock of $50,000. E. O. Lindley is president and F. T. Kincaid, secretary of the company, which will engage in the manufacture of furniture. Officers of the company state that negotiations are under way for the purchase of a plant already equipped, but that these have not been concluded. In the event that a new plant is erected it will be equipped with entirely new machinery.

Charles F. Grainger, of Grainger & Co., Louisville, who is president of the Board of Water Works, has been reappointed a member of the board by Mayor W. O. Head.

The Iles Contracting Company, Louisville, has been incorporated with $3000 capital stock by Charles Stilger and others. A steam roller is about the most important item of equipment to be purchased.

The National Smoke Preventer Company, which was organized in Louisville recently, has incorporated at Knoxville, Tenn., with $50,000 capital stock, the incorporators of the company being T. I. Stephenson, W. P. Davis, C. A. Brown and others. The company will operate a factory in Louis- Louis for the manufacture of automatic smoke consumers.

The O'Neil Coal Company, Island, Ky., is preparing to purchase machinery for the operation of a 75-ton mine which is just being opened. Secretary W. C. Ferguson is in charge of the mechanical work.

The Marrowbone Coal & Coke Company, which operates mines at Lookout, Ky., and has its main offices at Uniontown, Pa., has announced plans for the construction of 60 additional beehive coke ovens at Lookout. Edward Holle, of Pikeville, Ky., is the engineer in charge.

LaCenter, Ky., is planning the establishment of a water works system but definite details are lacking.

W. A. Dodds is establishing a plant for the manufacture of pressed brick at Hickman, Ky., most of the machinery having been contracted for.

The machine shops and tipple of the Bell Union Coal Company, at Curlew, Ky., were destroyed by fire March 22. They will be rebuilt.

Fire destroyed the machine shop of A. C. Burry, at Campbellsville, Ky., March 18, the loss being $2500.

Dawson Springs, Ky., is having plans drawn for a water works system by the engineering department of Paducah, Ky. J. W. Holmes, superintendent of the Paducah water works, is consulting engineer. Pumps will be installed and water will be drawn from three artesian wells and 10,000 ft. of mains will be laid.

The company formed to develop the manganese property near Newport, Tenn., has been incorporated under the name of the Tennessee Manganese Company, with $50,000 capital stock. John M. Doan is president, John Sant vice-president and general manager, Thomas H. Sant secretary and George F. Young treasurer. The offices of the company are at East Liverpool, Ohio. Forty tons of washed ore will be handled daily, and trade with steel mills is now being established. John N. Adams is the engineer in charge at Newport. The equipment has been bought.

N. B. Underwood is reported to be planning the development of manganese deposits near Sivierville, Tenn. He has taken options on a large tract.

The Kentucky-Tennessee Phosphate Company has been incorporated at Nashville, Tenn., with $500,000 capital stock, for the development of phosphate lands in the States mentioned. S. Strudwick, K. H. Carpenter, E. Robin Jones and James C. Bradford are among the incorporators.

Polishing machines, air compressors and other equipment are wanted by the Lexington Monument Works, Lexington, Tenn., which has been organized with Joseph W. Fuller as general manager. C. P. Wilson is president of the company, which will establish a large monument works.

The West Tennessee Investment Company is establishing a laundry at Dyersburg, Tenn., and is asking for prices on equipment, including a 25-hp. engine.

The plant of Keenan, Wade & Wade will be purchased by the city of Trenton, Tenn., for electric light purposes if a bond issue of $22,000 now pending is authorized. Most of the proceeds will be used for remodeling and equipping the plant.

Three miles of pipe line will be laid by the city of Newport, Tenn., to bring water to the city from springs. A bond issue for the work will be voted on April 29.

The Gray & Dudley Hardware Company, Nashville, Tenn., has increased its capital stock from $850,000 to $1,000,000. It is understood that the increase is for the purpose of providing funds for improvements in the plants operated by the company, which include those for the manufacture of harness, saddlery, stoves and ranges.

Work is progressing rapidly on the power plant of the

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Tallulah Falls Power Company, Tallulah Falls, Ga. The general contractor is the Borthern Construction Company, and the contract for the concrete work has just been let to Condon & Milner, Knoxville, Tenn. It amounts to $400,000. The plant is to produce 50,000 h.p., and it will provide light and power for consumption in Atlanta.

The Anderson Resilient Auto Wheel Company, recently incorporated in Nashville, Tenn., has organized by electing O. H. Anderson president, J. T. Timberlake vice-president and G. I. Frazier secretary and treasurer. It has not yet been decided where the wheels are to be manufactured. The company has a capital stock of $500,000.

W. H. Thompson, Brookhaven, Miss., is in the market for machinery for the manufacture of wooden buckets.

The J. B. McCrary Company, Atlanta, Ga., has been given the contract for the erection of the electric light plant at Albertville, Ala. The equipment, consisting of an 80 h.p. engine and dynamo has been ordered.

Power and woodworking equipment, including planers, matchers, edgers, &c., is wanted by the Beckwith & Pepple, Foley, Ala., who are establishing a planing mill.

Surveys are being made in connection with the proposed plant of the Little River Falls Power Company, which is planned for Little River Falls, in Alabama. It is intended to furnish power for manufacturing plants in Gadsden. R. A. Mitchell is intreseted.

The Memphis, Bridge Company, Memphis, Tenn., has been awarded the contract for a steel bridge to be erected at DeWitt, Ark.

The Spring River Power Company, Jonesboro, Ark., has been formed with $100,000 capital stock. A plant will be erected which will furnish power and light to towns located in that general district.

J. P. Saddler is planning the erection of a factory for the manufacture of buggies at Bowling Green, Ky. He was formerly in this business at Owensboro, Ky.

The sawmill of the McLean Lumber Company, Chattanooga, Tenn., was burned March 22, the loss being $60,000. In rebuilding practically all of the machinery, including the power plant, will have to be replaced.

The Furnace Equipment Company, Maryville, Tenn., recently incorporated, has taken over the business of the Maryville Foundry. The company will manufacture the McNaughton grate bar, of which V. J. Adams, Chandler Building, Atlanta, Ga., is sales agent.

The citizens of Tarboro, N. C., will vote on $25,000 bonds for proposed water works at a special election, May 1.

Texas

AUSTIN, TEXAS, March 25, 1911.

The agricultural and much of the ranch portions of the State have been visited by good rains the past week. The present prospects for a good crop season are unusually favorable. Satisfactory business conditions are reported from all parts of Texas and the Southwest. In Mexico the revolutionary situation is causing serious damage to nearly every line of industry. An enormous falling off in the machinery trade in that country is noted. This is particularly true as to mine and milling machinery. Many orders that were placed with United States concerns before the beginning of the revolutionary disturbances have been canceled temporarily. The tying up of railroads leading into the mining districts of Northwestern Mexico has made it impossible to ship in machinery.

The Board of Commissioners of Milam County is erecting two new steel bridges, in addition to the one that was recently finished, over Walker's Creek.

The City Council of Brenham has under consideration an application that has been made to it for the installation of a gas plant and distributing system. The proposed franchise is for 50 years, and the sum that is to be spent in the establishment of the plant shall not be less than $40,000. The Council has also ordered improvements to be made to the water works plant. A new brick building for the pumping station will be built and 100 additional water meters installed. Henry E. Booker is superintendent.

An election will be held at Hearne on April 18 to vote on the proposition of issuing bonds for the installation of a water works plant and distributing system.

The laying of a natural gas pipe line from the Caddo field, near Shreveport, La., to Houston, and the installation of a distributing system in the latter city is a project that is being considered by Louis Denning, president of the Bush-Everett Company of St. Louis, Mo., and G. L. Craig of Pittsburgh, Pa. They recently made a thorough investigation of the situation at Houston with the view of making formal application in due time for a franchise over the streets of the city for the proposed distributing system. The proposed pipe line will be about 200 miles long, and along its route are a number of thriving towns and several large lumber mills and other industries.

The construction of a new 1000-ton sugar mill at San Benito will soon be started. The contract was recently let for the burning of 500,000 brick that are to be used in the construction of the necessary building. Alba Heywood of San Benito is interested in the enterprise.

The recent sale of $2,000,000 of 5 per cent. bonds by the city of Fort Worth has provided the money necessary for the construction of a large surface reservoir for the water works system of that city and for the carrying out of other municipal improvements.

The La Donna Sugar Company is erecting a sugar mill, to cost more than $1,000,000, at Donna. A. M. Snider of Cleveland, Ohio, is largely interested in the enterprise.

Dr. F. S. Pearson of New York and a number of British associates have taken preliminary steps toward the establishment of a large hydroelectric and irrigation enterprise in southwest Texas. It is announced that representatives of the syndicate have obtained options on several hundred thousand acres of land in the valleys of the Medina and Nueces rivers, and that surveys have been made for a series of dams and reservoirs and hydroelectric plants. This syndicate is composed of the same men who own the Mexico Light & Power Company and its subsidiary concerns in Mexico, including the great hydroelectric plant at Necaxa. It is announced that the initial plans call for the expenditure of more than $5,000,000 in construction and development work. C. H. Carney, manager and chief engineer of the Mexico Light & Power Company, with headquarters in the City of Mexico, is actively in charge of the Texas project of the syndicate.

D. B. Chapin of Chapin has been investigating the situation along Devil's River, in western Texas, with the view of constructing one or more large dams across the canyon of that stream and reclaiming many thousands of acres of land by means of irrigation. His plans contemplate the construction of large canal systems and the installation of pumping plants.

W. D. Faus will install a plant at Gonzales for the manufacture of concrete blocks and other building material.

A syndicate of Houston men, consisting of Carey Shaw, C. L. Bradley, K. H. Cawthon, Edward Kennedy and others, will install a water works system and other public utilities on a subdivision of 830 acres of land situated adjacent to Houston.

The Luling Electric Light & Power Company has been granted a franchise by the City Council of Luling to install, maintain and operate an electric light and power plant.

Hamilton Bros., Chicago, Ill., will install a system of sewers at Cameron, Texas.

The United States & Mexican Trust Company is preparing to colonize and place under irrigation 22,000 acres of land in the Imperial Valley, 50 miles from Fort Stockton, on the line of the Kansas City, Mexico & Orient Railroad. Irrigating pumping machinery will be installed and other improvements made. The company's headquarters are at Kansas City, Mo.

H. A. Waddell and associates will install a box factory and sawmill near Morgan City, La., at a cost of about $300,000.

The bottling works of Stephens & Schade at Clifton, Ariz., that were recently destroyed by fire, entailing a loss of about $30,000, will be rebuilt.

The City Council of Las Cruces, N. M., has granted a franchise to the Las Cruces Electric Light & Ice Company to install an electric light and power plant.

The Mexican Government has just granted a concession to Ingwald C. Thoresen, William Thompson and Adolfo Fenochio, all of Tampico, Mexico, for the erection and operation of a beet sugar factory at that place. It is stated that the proposed factory will cost upward of $1,000,000. It will be the first beet sugar factory to be erected in Mexico. The region around Tampico is said to be well adapted to the growing of sugar beets.

Miguel Naranjo of Lampasos, State of Nuevo Leon, Mexico, and associates have completed preliminary arrangements for the construction of a large system of irrigation near that place. A dam will be constructed across the Arroyo Blanco, at a cost of about $215,000, and form a large water storage reservoir. From this reservoir there will be constructed a large canal that will lead over the adjacent lands. Pumping plants will be installed and the land reclamation system established on a large scale, it is stated.

Harry E. Blake of Los Angeles, Cal., recently investigated the irrigation possibilities of the San Pedro and Sulphur Springs valleys in Arizona. He estimates that an abundant supply of water for irrigation can be obtained in wells and brought to the surface by means of pumping plants.

The Standard Oil Burner Company, San Antonio, will

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install a plant in that city for the manufacture of crude oil burners.

The city of New Braunfels is having plans prepared by the W. K. Palmer Company, 717 Dwight Building, Kansas City, Mo., for the installation of a municipal hydroelectric plant.

The Wichita Falls Motor Company, Wichita Falls, has been incorporated, with a capital stock of $160,000. The incorporators are J. A. Kemp, J. W. Culbertson, J. C. Ward and others.

Capt. A. B. Wolvin of Duluth, Minn., president of the Texas City Allied Companies, has been arranging for the expenditure of over $1,000,000 in terminal and harbor improvements at Texas City.

The Crouch Grain & Elevator Company, Fort Worth, announces that as soon as the fire insurance can be adjusted the company will rebuild the elevator recently destroyed by fire at Temple.

The Saner-Whiteman Lumber Company, Cairo, whose mill was burned March 6, will rebuild as soon as possible. The company has bought a small mill to cut the timbers to be put into the large one.

Central and Western Canada

WINNIPEG, MAN., March 21, 1911.

Business prospects in central and western Canada this spring are very favorable. Predictions are general that 1911 will be a year of great industrial expansion. Preparations are being made to erect new plants of different kinds and to add to others increased capacity. The prosperity of this part of the country is apparent on every hand, and if seeding conditions will be favorable business men should have nothing to fear for another year at least.

The Asbestos Mfg. Company, Vancouver, B. C., has decided to add three more machines to its plant.

Balbraith & Son, sash and door manufacturers, New Westminster, B. C., contemplate taking over the Page & Bremner sawmill on Lulu Island and making extensive additions if granted a 25-year lease by the city.

The Winnipeg Street Railway Company has let the contract for the plant of the new power station which will be built this summer. It will be installed in four units of 3000 kw. each.

During the coming summer the Canadian Pacific Railway will erect a pumping station on the Souris River, about eight miles from North Portal, Sask., to convey the water by pipes to North Portal. The undertaking will cost about $50,000.

A tool factory is to be established across the river from New Westminster, B. C. The name of the concern is the Drop Forge Mfg. Company.

The Central Electric & Gas Company, Portage la Prairie, Man., will enlarge its plant this year.

It is announced that the Barnett-McQueen Company, contractor, will establish a bolt factory at Fort William.

The city commissioners of Saskatoon, Sask., are considering the advisability of doubling the capacity of the city's power plant.

Tenders will be received up to and including April 4 by W. H. Stewart, treasurer of the town of Rondeau, Sask., for electrical machinery, pumping machinery, producer gas plant, 14,000 ft. water mains, 22 hydrants, 47 6-in. left-handed gate valves and 47 6-in. valve boxes.

It is announced that G. Gale & Sons, manufacturers of brass and iron bedsteads, headquarters at Waterville, Quebec; branches at Montreal, Toronto and Winnipeg, will erect a factory in Winnipeg to cost about $50,000.

The Winnipeg branch of the Dominion Bridge Company, Ltd., is now in operation. Extensive alterations and improvements have been made. It is fitted with modern machinery, and has a capacity of 15,000 tons per annum.

George Anderson & Co., engineers and iron founders, of Carnoustie, Scotland, have opened an office at 504 Builders' Exchange, Winnipeg.

The contract for 100 miles of grading and ballasting on the Alberta Central Railway has been awarded to James McDonald & Co., Winnipeg. The price is $25,000 a mile, the total being $2,500,000. The road leads to the Brazian coal fields.

Sir Donald Mann, vice-president of the Canadian Northern Railway Company, states that the company's new terminal station at Winnipeg will cost $5,000,000.

Harrod's Stores, London, England, will build a store at Calgary, Alberta, to cost $1,500,000. The assistant and general manager, Winnipeg, are in Toronto this week to make arrangements with the architects.

Only two tenders were received in response to the call for boiler installation at the municipal power plant, Edmonton, Alberta. New specifications will, therefore, be issued and tenders again called for. Two 400-hp. boilers, or one unit of 800 hp., and one 500-hp. boiler for the pumping plant are wanted.

Four hundred and fifty tons of machinery have arrived at Vancouver for the Ocean Falls Company's pulp plant at the Bella Coola Inlet, B. C. The vessel came round the Horn from Eastern Canada and New York. Part of its cargo consisted of electrical apparatus from an Ontario company. More machinery is being taken in at Vancouver. To the equipment of the new plant many countries contribute. Several small machines come from Manchester, England; the wet machines come from Christiania, Norway; the turbines are partly from Kristineham, Sweden, and partly from Winterthur, Switzerland. Both eastern and western Canada, as well as the United States, have a hand in furnishing the plant.

Patrick Burns, the Calgary meat packer, is credited with the intention of building a large packing plant at Edmonton, Alberta.

The Winnipeg Steel Granary & Culvert Company, St. Boniface, Man., recently incorporated with $100,000 capital stock, advises that it has completed the erection of a factory, and has all the equipment installed.

Eastern Canada

TORONTO, ONT., March 25, 1911.

Contracts have been entered into by the three transcontinental railway companies for the construction of a large mileage in the West this summer. The contracts aggregate $42,000,000. They do not cover all the construction plans of the companies for the season. In the Province of Ontario both the Canadian Pacific and the Canadian Northern will add considerably to their lines. The Grand Trunk will also spend liberally on the double-tracking of various portions of its system in Ontario. On the Government Division of the National Transcontinental much ground will be covered in the course of the campaign opening with the spring, the trans-Ontario section being the portion on which the contractors have most to do. The Ontario Government is pushing construction on the Porcupine branch of its Temiskaming & Northern Ontario Railway. Active though it is, railway building lags behind other departments of enterprise. Most of the roads to be built this summer are urgently called for, for the carrying in of supplies and equipment to farmers, miners, lumbermen and primary industries that have ventured beyond the railway zone. In all fields of productive and commercial business the outlook is excellent. The crops are expected to get an early start, and that means much for wealth production in Canadian latitudes. That the banks have confidence in the situation is indicated by the expansion of commercial loans. At this season the banks are usually cautious in the making of loans or advances, but the prospects in the present spring are evidently considered attractive. In these days of railway-making, of departures into new branches of industry, of increasing immigration and of swelling imports of capital, the products of iron and steel are in especial demand. In the making of a great country, as distinct from the providing of a fully developed country, the consumption of iron and steel materials and instrumentalities dwarfs consumption in many other lines. The iron and steel industries drawn upon get the benefit of much of the capital expenditure as well as of that on current account, whereas most other industries have to depend largely on the latter.

The Northern Navigation Company, Collingwood, Ont., is about to call tenders for the building of a fast steamship for the Upper Lakes. The cost is to be about $600,000.

The Associated Portland Cement Company, London, England, is said to be contemplating the establishment of a number of plants in Canada at points scattered from the Atlantic to the Pacific. This would involve the expenditure of millions of dollars in construction.

The Public Works Department of Canada is about to call tenders for the construction of a new block at Ottawa, the estimated cost to be $3,500,000.

The office building the Canadian Pacific Railway Company is starting to build at the principal street intersection in Toronto is to be the tallest in the city. It will be 16 stories.

Polson Iron Works, Ltd., Toronto, will begin at once the construction of a floating dock in connection with its plant here. It will be of two sections, each 150 ft. long and 165 ft. over the outriggers. The sections will be built of steel throughout. They will be electrically driven by four

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centrifugal pumps with a capacity of 5000 gal. per minute. The motors will have a capacity of 50 hp. each.

The Campbell Milling Company, Toronto, announces that it will build a 3000-bbl. flour mill at Midland, Ont., at an estimated cost of $400,000. Plans have been decided upon and contracts will shortly be let.

Gunns, Ltd., is erecting a refinery for cotton seed oil near its abattoir in Toronto, capacity two carloads per day. This will be the first industry of the kind in Canada. Cotton seed, now dutiable at 17½ per cent. ad valorem would come in free under the reciprocity agreement.

The contract for building the bridge over the River Chaudière at St. George, Beauce County, Quebec, has been awarded to O'Neil & Loney, Quebec City.

Moffatt & Irving, Toronto, have applied to the Board of Control here for a site of 5 acres in Ashbridge's Marsh. They propose to erect a large iron and steel plant.

The Town Council of Galt, Ont., has decided to spend $12,000 in the purchase of a 120-acre farm in the town limits, the property to be used for factory sites.

David Dick & Sons, Ltd., Welland, Ont., have the contract to build the Page-Hersey Iron Tube & Lead Company's plant at Welland for $150,000.

The Standard Steel Works, Ltd., capital stock $1,000,000, head office Montreal, has been incorporated under Dominion laws.

In its agreement with the City Council of Peterborough, Ont., the Independent Tire Company undertakes to put in $75,000 of new machinery. The agreement has yet to receive the sanction of the ratepayers.

A bridge is to be erected at Indiantown, N. B., this summer. It is to have three spans, each 220 ft. long. The substructure will be of concrete and the superstructure of steel. It is to take the place of a ferry.

The New Dominion Motors Company has been incorporated under Ontario laws. Capital stock $100,000 and principal place of business Walkerville, Ont.

Numerous tenders have been received for the installation of a natural gas plant and for the construction of a street railway system in Moncton, N. B. The undertakings are being carried out by the municipality. The tenders have been forwarded to the city's consulting engineer in London, England.

The Hoover Suction Sweeper Company, Ltd., Windsor, Ont., recently incorporated, is an offspring of the Hoover Suction Sweeper Company, New Berlin, Ohio, from which place the business of the Canadian company will be conducted.

Pacific Coast

H. J. Burns, Spokane, Wash., has under construction a one-story brick factory building, 50 x 80 ft., which will be equipped for the construction of blower systems for planing mills and large storage tanks for irrigation purposes and other heavy sheet metal work.

Bellingham, Wash., is having plans prepared for enlargement of its pumping station. N. A. Whitney is city engineer.

The Agutter-Griswold Company, Seattle, Wash., manufacturer of switchboards and other electrical goods, is erecting a new factory building, 60 x 120 ft., three stories and basement. The first floor will be used for offices and storeroom purposes, and the second for the manufacture and assembling of switches, panelboards and switchboards. The entire third floor will be occupied by the sheet metal department. Besides the machinery required for punching and forming, there will be separate rooms equipped for the various finishing processes. The building will be equipped with a heating plant and a freight elevator, and all machinery will be driven by electric motors.

The Diamond Carriage Company, Spokane, Wash., is erecting a factory building, 50 x 142 ft., two stories and basement, of brick construction with cement floors. The basement will be used as a garage for motor trucks for which the company is agent. The company manufactures delivery wagons, trucks, auto bodies and does a general repairing business. Additional woodworking and ironworking machinery will be installed in the near future.

Government Purchases

WASHINGTON, D. C., March 26, 1911.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids April 18, schedule 3451, for one gasoline engine; schedule 3452, for seven engine lathes, and schedule 3453, for one file sharpening apparatus, one portable electric grinder, three lathes, one milling machine, one pipe threading and cutting-off machine, one drill press and one shaft straightener.

The Bureau of Yards and Docks, Navy Department, Washington, will open bids April 29 for turbo-alternators and electrical equipment for the United States Naval Station, Pearl Harbor, Hawaii.

Bids were opened March 21 by the Bureau of Supplies and Accounts, Navy Department, Washington, as follows:

Class 1.—Two turbo-generating sets, one motor generating set and one switchboard—Bidder 1, Atwood-Rearick Company, New York, $14,286; 35, General Electric Company, Schenectady, N. Y., $11,801; 97, Terry Steam Turbine Company, New York, $12,540.

Class 11.—One vertical hollow chisel mortising machine—Bidder 9, Bentel & Margedant Company, Hamilton, Ohio, $1540; 28, Defiance Machine Works, Defiance, Ohio, $1100; 32, J. A. Fay & Egan Company, Cincinnati, Ohio, $1195; 36, Greenlee Bros. & Co., Chicago, Ill., $1310; 40, Griscom-Spencer Company, New York, $1095; 71, Manning, Maxwell & Moore, New York, $1305; 105, S. A. Woods Machine Company, Boston, Mass., $1670.38.

Class 21.—Two motor driven lathes—Bidder 4, American Tool Works, Cincinnati, Ohio, $1557; 33, Fairbanks Company, Washington, D. C., $2080; 34, Frevert Machinery Company, New York, $1446 and $1353; 37, Garvin Machine Company, New York, $1410 and $1345; 40, Griscom-Spencer Company, New York, $1243.13; 46, Hendey Machine Company, Torrington, Conn., $2394, $2379 and $2404; 53, J. H. Johnson, Jr., Company, Philadelphia, Pa., $1479 and $1619; 57, J. P. Kemp, Baltimore, Md., $1755.25 and $1559.25; 71, Manning, Maxwell & Moore, New York, $2394, $2379, $2405, $1830 and $1580; 73, Niles-Bement-Pond Company, New York, $1713; 76, Prentiss Tool & Supply Company, New York, $1505 and $1521.

The American Electrochemical Society's Meeting

The nineteenth general meeting of the American Electrochemical Society will be held in the new Chemists' Club Building, 50 East Forty-first street, New York, April 6, 7 and 8. A copy of the programme of this meeting has been received from the secretary, Prof. Joseph W. Richards, Lehigh University, South Bethlehem, Pa. It provides for the reading and discussion of a large number of papers, and for excursions and entertainments, including the entertainment of ladies. Among the papers are the following:

"A New Electric Resistance Furnace," by F. A. J. FitzGerald.

"Reliability of Electric Furnaces for Commercial Work," by F. T. Snyder.

"An Electric Furnace for Heating Bars and Billets," by Thaddeus F. Baily.

"Electrolytic Refining as a Step in the Preparation of Steel," by C. F. Burgess.

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THE MACHINERY MARKETS

install a plant in that city for the manufacture of crude oil burners.

The city of New Braunfels is having plans prepared by the W. K. Palmer Company, 717 Dwight Building, Kansas City, Mo., for the installation of a municipal hydroelectric plant.

The Wichita Falls Motor Company, Wichita Falls, has been incorporated, with a capital stock of $160,000. The incorporators are J. A. Kemp, J. W. Culbertson, J. C. Ward and others.

Capt. A. B. Wolvin of Duluth, Minn., president of the Texas City Allied Companies, has been arranging for the expenditure of over $1,000,000 in terminal and harbor improvements at Texas City.

The Crouch Grain & Elevator Company, Fort Worth, announces that as soon as the fire insurance can be adjusted the company will rebuild the elevator recently destroyed by fire at Temple.

The Saner-Whiteman Lumber Company, Cairo, whose mill was burned March 6, will rebuild as soon as possible. The company has bought a small mill to cut the timbers to be put into the large one.

Central and Western Canada

WINNIPEG, MAN., March 21, 1911.

Business prospects in central and western Canada this spring are very favorable. Predictions are general that 1911 will be a year of great industrial expansion. Preparations are being made to erect new plants of different kinds and to add to others increased capacity. The prosperity of this part of the country is apparent on every hand, and if seeding conditions will be favorable business men should have nothing to fear for another year at least.

The Asbestos Mfg. Company, Vancouver, B. C., has decided to add three more machines to its plant.

Balbraith & Son, sash and door manufacturers, New Westminster, B. C., contemplate taking over the Page & Bremner sawmill on Lulu Island and making extensive additions if granted a 25-year lease by the city.

The Winnipeg Street Railway Company has let the contract for the plant of the new power station which will be built this summer. It will be installed in four units of 3000 kw. each.

During the coming summer the Canadian Pacific Railway will erect a pumping station on the Souris River, about eight miles from North Portal, Sask., to convey the water by pipes to North Portal. The undertaking will cost about $50,000.

A tool factory is to be established across the river from New Westminster, B. C. The name of the concern is the Drop Forge Mfg. Company.

The Central Electric & Gas Company, Portage la Prairie, Man., will enlarge its plant this year.

It is announced that the Barnett-McQueen Company, contractor, will establish a bolt factory at Fort William.

The city commissioners of Saskatoon, Sask., are considering the advisability of doubling the capacity of the city's power plant.

Tenders will be received up to and including April 4 by W. H. Stewart, treasurer of the town of Rondeau, Sask., for electrical machinery, pumping machinery, producer gas plant, 14,000 ft. water mains, 22 hydrants, 47 6-in. left-handed gate valves and 47 6-in. valve boxes.

It is announced that G. Gale & Sons, manufacturers of brass and iron bedsteads, headquarters at Waterville, Quebec; branches at Montreal, Toronto and Winnipeg, will erect a factory in Winnipeg to cost about $50,000.

The Winnipeg branch of the Dominion Bridge Company, Ltd., is now in operation. Extensive alterations and improvements have been made. It is fitted with modern machinery, and has a capacity of 15,000 tons per annum.

George Anderson & Co., engineers and iron founders, of Carnoustie, Scotland, have opened an office at 504 Builders' Exchange, Winnipeg.

The contract for 100 miles of grading and ballasting on the Alberta Central Railway has been awarded to James McDonald & Co., Winnipeg. The price is $25,000 a mile, the total being $2,500,000. The road leads to the Brazian coal fields.

Sir Donald Mann, vice-president of the Canadian Northern Railway Company, states that the company's new terminal station at Winnipeg will cost $5,000,000.

Harrod's Stores, London, England, will build a store at Calgary, Alberta, to cost $1,500,000. The assistant and general manager, Winnipeg, are in Toronto this week to make arrangements with the architects.

Only two tenders were received in response to the call for boiler installation at the municipal power plant, Edmonton, Alberta. New specifications will, therefore, be issued and tenders again called for. Two 400-hp. boilers, or one unit of 800 hp., and one 500-hp. boiler for the pumping plant are wanted.

Four hundred and fifty tons of machinery have arrived at Vancouver for the Ocean Falls Company's pulp plant at the Bella Coola Inlet, B. C. The vessel came round the Horn from Eastern Canada and New York. Part of its cargo consisted of electrical apparatus from an Ontario company. More machinery is being taken in at Vancouver. To the equipment of the new plant many countries contribute. Several small machines come from Manchester, England; the wet machines come from Christiania, Norway; the turbines are partly from Kristineham, Sweden, and partly from Winterthur, Switzerland. Both eastern and western Canada, as well as the United States, have a hand in furnishing the plant.

Patrick Burns, the Calgary meat packer, is credited with the intention of building a large packing plant at Edmonton, Alberta.

The Winnipeg Steel Granary & Culvert Company, St. Boniface, Man., recently incorporated with $100,000 capital stock, advises that it has completed the erection of a factory, and has all the equipment installed.

Eastern Canada

TORONTO, ONT., March 25, 1911.

Contracts have been entered into by the three transcontinental railway companies for the construction of a large mileage in the West this summer. The contracts aggregate $42,000,000. They do not cover all the construction plans of the companies for the season. In the Province of Ontario both the Canadian Pacific and the Canadian Northern will add considerably to their lines. The Grand Trunk will also spend liberally on the double-tracking of various portions of its system in Ontario. On the Government Division of the National Transcontinental much ground will be covered in the course of the campaign opening with the spring, the trans-Ontario section being the portion on which the contractors have most to do. The Ontario Government is pushing construction on the Porcupine branch of its Temiskaming & Northern Ontario Railway. Active though it is, railway building lags behind other departments of enterprise. Most of the roads to be built this summer are urgently called for, for the carrying in of supplies and equipment to farmers, miners, lumbermen and primary industries that have ventured beyond the railway zone. In all fields of productive and commercial business the outlook is excellent. The crops are expected to get an early start, and that means much for wealth production in Canadian latitudes. That the banks have confidence in the situation is indicated by the expansion of commercial loans. At this season the banks are usually cautious in the making of loans or advances, but the prospects in the present spring are evidently considered attractive. In these days of railway-making, of departures into new branches of industry, of increasing immigration and of swelling imports of capital, the products of iron and steel are in especial demand. In the making of a great country, as distinct from the providing of a fully developed country, the consumption of iron and steel materials and instrumentalities dwarfs consumption in many other lines. The iron and steel industries drawn upon get the benefit of much of the capital expenditure as well as of that on current account, whereas most other industries have to depend largely on the latter.

The Northern Navigation Company, Collingwood, Ont., is about to call tenders for the building of a fast steamship for the Upper Lakes. The cost is to be about $600,000.

The Associated Portland Cement Company, London, England, is said to be contemplating the establishment of a number of plants in Canada at points scattered from the Atlantic to the Pacific. This would involve the expenditure of millions of dollars in construction.

The Public Works Department of Canada is about to call tenders for the construction of a new block at Ottawa, the estimated cost to be $3,500,000.

The office building the Canadian Pacific Railway Company is starting to build at the principal street intersection in Toronto is to be the tallest in the city. It will be 16 stories.

Polson Iron Works, Ltd., Toronto, will begin at once the construction of a floating dock in connection with its plant here. It will be of two sections, each 150 ft. long and 165 ft. over the outriggers. The sections will be built of steel throughout. They will be electrically driven by four

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centrifugal pumps with a capacity of 5000 gal. per minute. The motors will have a capacity of 50 hp. each.

The Campbell Milling Company, Toronto, announces that it will build a 3000-bbl. flour mill at Midland, Ont., at an estimated cost of $400,000. Plans have been decided upon and contracts will shortly be let.

Gunns, Ltd., is erecting a refinery for cotton seed oil near its abattoir in Toronto, capacity two carloads per day. This will be the first industry of the kind in Canada. Cotton seed, now dutiable at 17½ per cent. ad valorem would come in free under the reciprocity agreement.

The contract for building the bridge over the River Chaudière at St. George, Beauce County, Quebec, has been awarded to O'Neil & Loney, Quebec City.

Moffatt & Irving, Toronto, have applied to the Board of Control here for a site of 5 acres in Ashbridge's Marsh. They propose to erect a large iron and steel plant.

The Town Council of Galt, Ont., has decided to spend $12,000 in the purchase of a 120-acre farm in the town limits, the property to be used for factory sites.

David Dick & Sons, Ltd., Welland, Ont., have the contract to build the Page-Hersey Iron Tube & Lead Company's plant at Welland for $150,000.

The Standard Steel Works, Ltd., capital stock $1,000,000, head office Montreal, has been incorporated under Dominion laws.

In its agreement with the City Council of Peterborough, Ont., the Independent Tire Company undertakes to put in $75,000 of new machinery. The agreement has yet to receive the sanction of the ratepayers.

A bridge is to be erected at Indiantown, N. B., this summer. It is to have three spans, each 220 ft. long. The substructure will be of concrete and the superstructure of steel. It is to take the place of a ferry.

The New Dominion Motors Company has been incorporated under Ontario laws. Capital stock $100,000 and principal place of business Walkerville, Ont.

Numerous tenders have been received for the installation of a natural gas plant and for the construction of a street railway system in Moncton, N. B. The undertakings are being carried out by the municipality. The tenders have been forwarded to the city's consulting engineer in London, England.

The Hoover Suction Sweeper Company, Ltd., Windsor, Ont., recently incorporated, is an offspring of the Hoover Suction Sweeper Company, New Berlin, Ohio, from which place the business of the Canadian company will be conducted.

Pacific Coast

H. J. Burns, Spokane, Wash., has under construction a one-story brick factory building, 50 x 80 ft., which will be equipped for the construction of blower systems for planing mills and large storage tanks for irrigation purposes and other heavy sheet metal work.

Bellingham, Wash., is having plans prepared for enlargement of its pumping station. N. A. Whitney is city engineer.

The Agutter-Griswold Company, Seattle, Wash., manufacturer of switchboards and other electrical goods, is erecting a new factory building, 60 x 120 ft., three stories and basement. The first floor will be used for offices and storeroom purposes, and the second for the manufacture and assembling of switches, panelboards and switchboards. The entire third floor will be occupied by the sheet metal department. Besides the machinery required for punching and forming, there will be separate rooms equipped for the various finishing processes. The building will be equipped with a heating plant and a freight elevator, and all machinery will be driven by electric motors.

The Diamond Carriage Company, Spokane, Wash., is erecting a factory building, 50 x 142 ft., two stories and basement, of brick construction with cement floors. The basement will be used as a garage for motor trucks for which the company is agent. The company manufactures delivery wagons, trucks, auto bodies and does a general repairing business. Additional woodworking and ironworking machinery will be installed in the near future.

Government Purchases

WASHINGTON, D. C., March 26, 1911.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids April 18, schedule 3451, for one gasoline engine; schedule 3452, for seven engine lathes, and schedule 3453, for one file sharpening apparatus, one portable electric grinder, three lathes, one milling machine, one pipe threading and cutting-off machine, one drill press and one shaft straightener.

The Bureau of Yards and Docks, Navy Department, Washington, will open bids April 29 for turbo-alternators and electrical equipment for the United States Naval Station, Pearl Harbor, Hawaii.

Bids were opened March 21 by the Bureau of Supplies and Accounts, Navy Department, Washington, as follows:

Class 1.—Two turbo-generating sets, one motor generating set and one switchboard—Bidder 1, Atwood-Rearick Company, New York, $14,286; 33, General Electric Company, Schenectady, N. Y., $11,801; 97, Terry Steam Turbine Company, New York, $12,540.

Class 11.—One vertical hollow chisel mortising machine—Bidder 9, Bentel & Margedant Company, Hamilton, Ohio, $1540; 28, Defiance Machine Works, Defiance, Ohio, $1100; 32, J. A. Fay & Egan Company, Cincinnati, Ohio, $1195; 36, Greenlee Bros. & Co., Chicago, Ill., $1310; 40, Griscom-Spencer Company, New York, $1095; 71, Manning, Maxwell & Moore, New York, $1305; 105, S. A. Woods Machine Company, Boston, Mass., $1670.38.

Class 21.—Two motor driven lathes—Bidder 4, American Tool Works, Cincinnati, Ohio, $1557; 33, Fairbanks Company, Washington, D. C., $2080; 34, Frevert Machinery Company, New York, $1446 and $1358; 37, Garvin Machine Company, New York, $1410 and $1345; 40, Griscom-Spencer Company, New York, $1243.13; 46, Hendey Machine Company, Torrington, Conn., $2394, $2379 and $2404; 53, J. H. Johnson, Jr., Company, Philadelphia, Pa., $1479 and $1619; 57, J. P. Kemp, Baltimore, Md., $1755.25 and $1559.25; 71, Manning, Maxwell & Moore, New York, $2394, $2379, $2405, $1830 and $1580; 73, Niles-Bement-Pond Company, New York, $1713; 76, Prentiss Tool & Supply Company, New York, $1505 and $1521.

The American Electrochemical Society's Meeting

The nineteenth general meeting of the American Electrochemical Society will be held in the new Chemists' Club Building, 50 East Forty-first street, New York, April 6, 7 and 8. A copy of the programme of this meeting has been received from the secretary, Prof. Joseph W. Richards, Lehigh University, South Bethlehem, Pa. It provides for the reading and discussion of a large number of papers, and for excursions and entertainments, including the entertainment of ladies. Among the papers are the following:

"A New Electric Resistance Furnace," by F. A. J. FitzGerald.

"Reliability of Electric Furnaces for Commercial Work," by F. T. Snyder.

"An Electric Furnace for Heating Bars and Billets," by Thaddeus F. Baily.

"Electrolytic Refining as a Step in the Preparation of Steel," by C. F. Burgess.

"Some Problems of the Electroplater," by G. B. Hogaboom.

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CURRENT METAL PRICES.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1¾ in. round and square	₩ lb 1.75¢
1½ to 4 in. x ⅜ to 1 in.	₩ lb 1.75¢
1½ to 4 in. x ¼ to 5-1	₩ lb 1.85¢
Rods—⅜ and 11-16 round and square	₩ lb 1.85¢

Angles:	Cts ₩ lb
3 in. x ¼ in. and larger	2.00¢
3 in. x 3-16 in. and ½ in.	2.25¢
1½ to 2½ in. x ¼ in.	2.10¢
1½ to 2½ in. x 9-16 in. and thicker	2.00¢
1 to 1¼ in. x 5-16 in.	2.10¢
1 to 1¼ x ⅛ in.	2.20¢
⅞ x ⅛ in.	2.30¢
¾ x ⅛ in.	2.40¢
⅝ x ⅛ in.	3.45¢
½ x 3-32 in.	4.25¢

Tees:	
1 in.	2.65¢
1¼ in.	2.45¢
1½ to 2½ x ¼ in.	2.15¢
1½ to 2½ x 3-16 in.	2.35¢
3 in. and larger	2.05¢
Beams	2.00¢
Channels, 3 in. and larger	2.00¢
Bands—1½ to 6 x 3-16 to No. 8	2.30¢
"Burden's Best" Iron, base price	3.15¢
Burden's "H. B. & S." Iron, base price	2.95¢
Norway Bars	3.00¢

Merchant Steel from Store—

	per ₩
Bessemer Machinery	1.90¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

	Black One Pass, C.R Soft Steel.	R. G. Cleaned.
No. 16	₩ lb 2.55¢	2.80¢
Nos. 18 to 20	₩ lb 2.70¢	2.90¢
Nos. 22 and 24	₩ lb 2.75¢	3.00¢
No. 26	₩ lb 2.85¢	3.10¢
No. 28	₩ lb 2.95¢	3.20¢

Russia, Planished, &c.

Genuine Russia, according to assortment, ₩ lb 12 @14½

Patent Planished, W. Dewees Wood, ₩ lb A, 10¢; B, 9¢ net.

Galvanized.

Nos. 12 and 14	₩ lb 2.95¢
Nos. 22 to 24	₩ lb 3.30¢
No. 26	₩ lb 3.50¢
No. 28	₩ lb 3.80¢

No. 30 and lighter 36 inches wide, 25¢ higher

Genuine Iron Sheets—

Galvanized.

Nos. 22 and 24	₩ lb 5.75¢
No. 26	₩ lb 6.25¢
No. 28	₩ lb 7.25¢

Corrugated Roofing—

2½ in. corrugated.	Painted	Galvd
No. 24	₩ 100 sq. ft. $3.85	4.80
No. 26	₩ 100 sq. ft. 2.95	4.00
No. 28	₩ 100 sq. ft. 2.60	3.75

Tin Plates—

American Charcoal Plates (per box.)

"A.A.A." Charcoal:	
IC, 14 x 20	$6.65
IX, 14 x 20	7.90
A. Charcoal:	
IC, 14 x 20	$5.60
IX, 14 x 20	5.70

American Coke Plates—Bessemer—

IC, 14 x 20 .....107 lb	$4.50
IX, 14 x 20	5.50

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating	$8.70
IX, 20 x 28 with an 8 lb. coating	10.70

Seamless Brass Tubes—

List November 13, 1908. Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price 18¢

Copper Tubes—

List November 13, 1908. Base price 21¢

Brazed Brass Tubes—

List February 1, 1911. 19½¢ ₩ lb

High Brass Rods—

List February 1, 1911. 14¼¢ ₩ lb

Roll and Sheet Brass—

List February 1, 1911. 14¼¢ ₩ lb

Brass Wire—

List February 1, 1911. 14¼¢ ₩ lb

Copper Wire—

Base Price. Carload lots mill 13½¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz (quantity lots) ₩ lb 18 ¢

Sheet Copper Cold Rolled, 1¢ ₩ lb advance over Hot Rolled.

Sheet Copper Polished 20 in. wide and under, 1¢ ₩ square foot

Sheet Copper Polished over 20 in. wide, 2¢ ₩ square foot.

Planished Copper, 1¢ ₩ square foot more than Polished.

METALS—

Tin—

Straits Pig ₩ lb 45 @45¢

Copper—

Lake Ingot	₩ lb 14¼@15 ¢
Electrolytic	₩ lb 14¼@14½¢
Casting	₩ lb 14¼@14½¢

Spelter—

Western ₩ lb 6¼@6½¢

Zinc.

No 9, base, casks ₩ lb 8 ¢ | Open ₩ lb 8½¢

Lead.

American Pig	₩ lb 5 @5¢
Bar	₩ lb 6¼@6½¢

Solder.

½ & ½, guaranteed	₩ lb 23 @23½¢
No. 1	₩ lb 26 @26½¢
Refined	₩ lb 23½@24 ¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson	₩ lb ...@10½¢
Hallett's	@10½¢
Other Brands	@9½¢

Bismuth—

Per lb $2.00@$2.25

Aluminum—

No 1 Aluminum (guaranteed over 99% pure), in ingot for remelting, 24¢

Rods & Wire Base Price 31¢

Sheets Base Price 33¢

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents ₩ lb
Copper, Heavy cut and crucible	10.75@11.00
Copper, Heavy and Wire	10.50@10.75
Copper, Light and Bottoms	9.50@ 9.75
Brass, Heavy	7.00@ 7.25
Brass, Light	5.50@ 5.75
Heavy Mechine Composition	9.25@ 9.50
Clean Brass Turnings	7.00@ 7.25
Composition Turnings	8.25@ 8.50
Lead, Heavy	@ 3.75
Lead, Tea	@ 3.50
Zinc Scrap	@ 4.00

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Their hard cutting surface and perfect temper gives them a **lasting quality** that makes them by far the most **economical** of all files to use.

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